ACCSF
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Five-Year Review Report

Third Five-Year Review Report
for
American Crossarm and Conduit Superfund Site
Chehalis, Washington

September 2009

PREPARED BY:

United States Army Corps of Engineers, Seattle District
And
U.S. EPA Region 10

for

United States Environmental Protection Agency
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Seattle, WA

Approved by:

Lori Cohen

Lori Cohen, Acting Director
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Date:

9/30/09

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List of Acronyms

ACC	American Crossarm and Conduit
AOC	Administrative Order of Consent for Use and Maintenance
ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
B(a)P	Benzo(a)Pyrene
BTEX	Benzene, Toluene, Ethylbenze and Xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIPP	Cured-in-place-pipe
COC	Contaminants of Concern
cPAH	Carcinogenic Polyaromatic Hydrocarbon
EPA	United States Environmental Protection Agency
HHRA	Human Health Risk Assessment
ICs,	Institutional Controls
MCL	Maximum Contaminant Level
MTCA	Model Toxic Control Act
NCP	National Contingency Plan
NPL	National Priorities List
ODEQ	Oregon Department of Environmental Quality
O&M	Operation and Maintenance
PAH	Polyaromatic Hydrocarbon
PCDD/F	Polychlorinated Dioxins and Furans
PCP	Pentachlorophenol
POTW	Public-Owned Treatment Works
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RPM	Remedial Project Manager
ROD	Record of Decision

SDWA	Safe Drinking Water Act
SLV	Screening Level Values
TEF	Toxic Equivalency Factor
TEQ	Toxic Equivalencies
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound
WAC	Washington Administrative Code
WQS	Water Quality Standards

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Executive Summary

This reports the findings of the third five-year review performed for the American Crossarm and Conduit (ACC) Superfund Site located in Chehalis, Washington (Site). The third five-year review was conducted to determine whether human health and the environment are being protected by implementation of the remedial action at the Site.

ACC was a wood treating facility contaminated by polyaromatic hydrocarbons (PAHs) and pentachlorophenol (PCP) through its day-to-day operations and by chlorinated dioxins and furans that were present as contaminants in PCP. On-Site contaminants spread to nearby residences by natural flooding. The Site was remediated in 1996 by the United States Environmental Protection Agency (EPA) in accordance with the Record of Decision (ROD), purchased by a private entity in 1997, redeveloped with new land owners and business structures, and is presently being used for commercial purposes. The third five-year review was conducted in accordance with the *Comprehensive Five Year Review Guidance* (U.S. EPA 2001) and includes the following:

- Review of Site data to evaluate compliance with the performance standard specified by the ROD.
- A Site inspection to confirm the remedial action remains protective of human health and the environment consistent with the ROD.
- Review of federal and state regulations promulgated since the last five-year review that could affect the overall protectiveness of the remedial action.

A review of the geologic conditions and historical groundwater data indicate that migration of residual soil contaminants is limited by the geology/hydrostratigraphy at the Site. As part of the remedial action, the most contaminated soils were removed from the treatment area where there was the highest potential for migration. Historic off-Site ground water contaminant concentrations have been below the Washington State Model Toxic Control Act (MTCA) Method B cleanup standards. Groundwater monitoring has not been performed since 2001. EPA recommends that the one remaining down-gradient off-Site groundwater monitoring well be sampled within the next year and the need for subsequent ground water sampling be addressed in the updated Operations and Maintenance (O&M) Plan.

On-Site ponded surface water samples were collected annually from 1997 through 2001. Low level PAHs were detected in the ponded surface water samples however none of the concentrations exceeded the acute or chronic aquatic water quality standards established as part of the ROD cleanup standards. No background samples or samples from other potential sources of PAHs were collected. Several sources of PAHs exist near these ponded surface water sample locations including the railroad tracks adjacent to the sampling locations, runoff from the northern portion of the Site, residual surface soil contamination in the wetland area, or perched leachate from the landfill. EPA recommends that the O&M plan be updated to suggest that if ponded surface water samples are collected in the future, off-Site ponded samples adjacent to the railroad ditch and background samples also be collected for comparison.

The remedial action was designed to remove the most highly contaminated soil from the Site and rely on institutional controls to manage waste remaining at depth. Protective covenants and use restrictions are currently in place for the Site properties and property owners are managing their parcels in accordance with the protective covenants and use restrictions. However, no annual inspections have occurred since issuance of the Second Five Year Review Report, except for quarterly visual inspections of the stormwater lagoon by the City of Chehalis. EPA recommends annual inspections resume and since much of the Site has changed in recent years, the O&M plan be updated to reflect current conditions.

As part of a screening level study to determine if residual contamination remained in the area near the Site, the Washington State Department of Ecology (Ecology) collected sediment and fish samples from Dillenbaugh Creek in 1998. A follow-up study was conducted in 2004. The Ecology studies determined that polychlorinated dioxins and furans (PCDD/F, or, collectively, dioxins) concentrations downstream of the Site were significantly higher than in background areas in Dillenbaugh Creek and the Chehalis River. Dioxin and furan concentrations were also significantly higher in fish tissue from Dillenbaugh Creek than from the Chehalis River. Because there are no Washington freshwater sediment criteria or standards, as a part of this five year review, EPA screened the sediment data against health protective risk-based sediment screening level values (SLVs) developed by the Oregon Department of Environmental Quality (ODEQ, Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment). This screening showed that the sediment levels of dioxin downstream of the Site are elevated above ODEQ's human health SLVs for 2,3,7,8- TCDD. Also, levels of dioxins in fish in Dillenbaugh Creek below the Site are higher than those from Dillenbaugh Creek above the Site or in the Chehalis River. There is uncertainty as to when this dioxin contamination was deposited and its source. Consumption of biota from Dillenbaugh Creek by humans was not included as an exposure pathway in the Site risk assessment or in the ROD. EPA recommends collection of additional sediment from Dillenbaugh Creek to determine if the sediments remain contaminated with chlorinated dioxins/furans and if so, whether ACC is the source. EPA further recommends that if Dillenbaugh Creek sediments exhibit ACC-related dioxins/furans above screening levels, an evaluation of the potential risks from bioaccumulation of dioxins into biota that are consumed by humans be completed.

Results of the ecological evaluation in the 1992 Risk Assessment indicate that the magnitude of impacts to ecological receptors is unknown due to the uncertainties inherent in the evaluation approach. More recent methods are available to evaluate both aquatic and terrestrial species. EPA recommends further review of the uncertainties associated with the 1992 Risk Assessment evaluation of impacts to ecological receptors and applying updated methods as appropriate to evaluate potential impacts from the ACC site on aquatic and terrestrial species.

The 1992 Risk Assessment did not evaluate vapor intrusion in the event of Site development. The most contaminated areas were excavated to a depth of 10 feet, backfilled and a soil cap with a geomembrane placed above these areas. Six to eight feet of additional fill was placed on top of the cap prior to construction of the buildings. However, for completeness and in accordance with EPA vapor intrusion guidance, vapor intrusion modeling to evaluate the potential pathway should be completed.

A protectiveness determination of the remedy at the ACC Site cannot be made at this time until the following work is completed: (1) collection of additional sediment samples from Dillenbaugh Creek to determine if sediments continue to exhibit dioxin/furan contamination; (2) if Dillenbaugh Creek sediments exhibit ACC-related dioxins/furans above screening levels and background, follow up with an evaluation of potential human health risks from exposure to contaminants in Dillenbaugh Creek sediments through consumption of biota that may bioaccumulate contaminants from the Creek; (3) vapor intrusion modeling. It is expected that this evaluation will take approximately 18 months to complete, at which time a protectiveness determination will be made.

The **Human Exposure Under Control Environmental Indicator** status for the ACC Site has been changed to "Current Human Exposures Controlled" from "Long-Term Human Health Protection Achieved" due to uncertainties identified in this Review. Once Dillenbaugh Creek sediment sampling and evaluation of related potential human health risks and vapor intrusion modeling are completed, the status will be updated.

The **Contaminated Groundwater Migration Under Control Environmental Indicator** status for the ACC Site remains "Under Control" because off-Site ground water contaminant concentrations have consistently been below the Washington State Model Toxic Control Act (MTCA) Method B cleanup standards.

The **Cross Program Revitalization Measure** status for the ACC Site remains "Protective for People Under Current Conditions". Once Dillenbaugh Creek sediment sampling and evaluation of related potential human health risks and vapor intrusion modeling are completed, the status will be updated.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: American Crossarm and Conduit Superfund Site		
EPA ID *(from WasteLAN)*: WAD057311094		
Region: 10	**State:** WA	**City/County:** Chehalis/Lewis County
SITE STATUS		
NPL status: : Final		
Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete		
Multiple OUs?* ☐ YES ☒ NO	**Construction completion date:** May 1996	
Has site been put into reuse? ☒ YES ☐ NO		
REVIEW STATUS		
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency		
Author name: Sharon Gelinas/Marlowe Laubach/Dana Davoli/Anne McCauley		
Author title: Hydrogeologist/Chemical Engineer/Risk Assessor/Project Manager	**Author affiliation:** USACE, Seattle/U.S. EPA Region 10	
Review period:** January 2009 – September 2009		
Date(s) of site inspection: January 22, 2009		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion		
Review number: ☐ 1 (first) ☐ 2 (second) ☒ 3 (third) ☐ Other (specify)		
Triggering action: ☐ Actual RA On-Site Construction at OU # ___ ☐ Actual RA Start at OU# ____ ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify)		
Triggering action date *(from WasteLAN)*: September 2004		
Due date *(five years after triggering action date)*: September 2009		

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

- No maintenance inspections have been performed and documented since the last five year review.

- Dillenbaugh Creek sediment samples collected in 1998 and 2004 exhibited dioxin contamination.

- Potential human health exposure from consumption of biota that have bioaccumulated contaminants from water and/or sediments in Dillenbaugh Creek has not been evaluated.

- The 1992 Risk Assessment method of evaluating impacts to ecological receptors resulted in uncertainties regarding the severity of potential impacts.

- The 1992 Risk Assessment did not evaluate vapor intrusion in the event of Site development.

Recommendations and Follow-up Actions:

- Perform and document regular maintenance inspections in accordance with the updated O&M plan.

- Develop and implement a sampling plan to determine if Dillenbaugh Creek sediments remain contaminated with dioxins/furans and if so, whether ACC is the source.

- If Dillenbaugh Creek sediments exhibit ACC-related dioxins/furans above screening levels and background, evaluate the potential risks from bioaccumulation of dioxins into biota that are consumed by humans.

- Review uncertainties associated with the 1992 Risk Assessment evaluation of impacts to ecological receptors. Apply updated methods as appropriate to evaluate potential impacts from the ACC Site on aquatic and terrestrial species.

- Complete vapor intrusion modeling to evaluate the potential pathway.

Protectiveness Statement(s):

A protectiveness determination of the remedy at the American Crossarm and Conduit Superfund Site cannot be made at this time. Further work is needed in the following areas: (1) collection of additional sediment samples from Dillenbaugh Creek to determine if sediments continue to exhibit dioxin/furan contamination; (2) if Dillenbaugh Creek sediments exhibit ACC-related dioxins/furans above screening and background levels, follow up with an evaluation of potential human health risks from exposure to contaminants in Dillenbaugh Creek sediments through consumption of biota that may bioaccumulate contaminants from the Creek; (3) completion of vapor intrusion modeling. These evaluations are estimated to take approximately 18 months to complete, at which time a protectiveness determination will be made.

Other Comments:

None.

American Crossarm and Conduit Superfund Site
Chehalis Washington
Third Five-Year Review Report

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues, if any, found during the review, and identify recommendations to address these issues.

The United States Environmental Protection Agency (EPA) is preparing this Third Five-Year Review Report pursuant to section 121 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 U.S.C. §9621 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

With oversight from the EPA Region 10 Remedial Project Manager, the United States Army Corps of Engineers (USACE) Seattle District conducted the five-year review of the remedy implemented at the American Crossarm and Conduit (ACC) Superfund Site in Chehalis, Washington (Site). This report documents the results of the review, which was conducted from November 2008 through September 2009.

This is the third five-year review for the ACC Site. The triggering action for this statutory review is the completion of the second five-year review, dated September 30, 2004. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1. Chronology of Site Events

Event	Date
Ecology conducts a compliance inspection of ACC. Violation found	Early 1983
ACC stops wood treating operations	Late 1983
ACC provides contaminated soils to the residential area to be used for fill	1985
Ecology directs ACC to remove contaminated fill from residential lots	1985
ACC abandons Site	Early 1986
Chehalis River floods. PCP left in tanks is spread throughout the neighborhood	Nov 1986
Emergency removal action taken to cleanup PCP from flood	Nov 1986
Incinerator brought on-Site and burns contaminated debris from the removal action	1988
ACC is listed on the National Priority List (NPL)	Oct 4, 1989
Remedial Investigation and Feasibility Study conducted	1989 - 1992
Tanks, piping, and asbestos removed from treatment works	Jun 1992
Proposed plan prepared and reviewed by the public	Sep 1992
Record of Decision signed	Jun 1993
Remedial design begins	Jan 1994
Cleanup construction begins	Sep 1994
Site floods	Nov 1995
Site floods	Feb 1996
Pre-final construction completion inspection performed by EPA and Ecology	Apr 1996
Site floods	Apr 1996
Remedial construction completed	May 1996
Site purchased at tax auction	Sep 1996
Site inspection	Nov 1998
Site redevelopment begins	Nov 1998
First Five Year Review inspection with Ecology	Sep 21, 1999
First Five Year Review signed	Sep 30, 1999

Event	Date
Second Five Year Review inspection with Ecology	Sep 9, 2004
Second Five Year Review signed	Sep 30, 2004

III. Background

Physical Characteristics

The 14-acre former wood treating facility is located on the south edge of Chehalis within the 100-year flood plain of the Chehalis and Newaukam rivers. Most of the facility rested in a marshy lowland on the east margin of a 2- to 3-mile-wide alluvial valley, which is slightly lower than the 100-year flood plain. Figure 1 shows the Site location.

For discussion purposes, the facility is divided into three areas: the treatment area, the mill, and the landfill. The treatment area, which contained underground tanks, a surface impoundment, and a control room, was used to treat wood with a mixture of diesel and PCP. This area also included an elevated crane-way and eight kilns used to dry timber prior to treatment. The mill was a large wooden structure that contained wood crossbars and conduit manufacturing equipment constructed in a low-lying area on posts/pilings to elevate it to the height of the kilns. The landfill was used to dispose of wood waste and other debris from operation of the mill and treatment works. Figure 2 shows the former facility buildings.

Land and Resource Use

From the early 1930s to 1983, wood cutting, milling, and treating operations were conducted at the Site. Wood waste, a waste stream from the milling operation, was placed in the wetland, creating a landfill. Wood treating began in the early 1930s. Crossarm and conduit for electrical utility poles were treated in open dip tanks with hot or cold creosote and PCP. Tank sludge is suspected to have been disposed of in the landfill. Solvents, paints, paint thinners, lubricating oils, petroleum products, and other miscellaneous wastes may also have been disposed of in the landfill. The landfill, used from the 1930s to 1985, was located south of the former mill. Immediately south of the facility is a wetland.

The three parcels comprising the ACC Site were purchased at a tax auction 1996 and the two northern parcels were subsequently sold in 2000 and 2002. The northernmost parcel was resold again in 2006. After approval from EPA and Ecology, two large pad style metal buildings were built on the two northern parcels and are shown in Figure 3.

Both buildings were built on an additional 6-8 feet of fill over the Site soil cover for the purpose of raising the building pads above the 100 year flood level. Both buildings were constructed in conformance with the Institutional Controls (ICs), have paved parking lots and appropriate landscaping normally found in business parking lots. No development has occurred on the landfill area in the southernmost parcel.
The current land use for the former facility is commercial. One building currently houses a repair and machine shop and the second building a fitness center. The current land use for the surrounding

area is residential and commercial. To the southwest of the former facility are residential neighborhoods. To the east of the former facility lies the Burlington Northern rail line.

Geology

Geology at the Site consists of unconsolidated fine to coarse grained fluvial (river) deposits and lacustrine (lake) deposits up to 40 feet thick resting on siltstone bedrock. Locally manmade fill has been placed on the river and lake deposits. The stratigraphic units, from bottom to top, are as follows:

- Marine siltstone bedrock.
- Coarse Grained Subunit of Newaukum Terrace. Composed of silty sand to poorly graded sand and gravel with clay.
- Fine Grained Subunit of Newaukum Terrace. Composed of clay to sandy silt.
- Undifferentiated alluvial/lacustrine silt. Composed of silty clay to sandy silt.
- Dillenbaugh Creek sediments.
- Anthropogenic fill. Composed of granular, fine grained, bark and woodchip, landfill debris, or storm drain sediments.

Hydrogeology

The groundwater underlying the Site is not currently used as a drinking water source. The primary drinking water intake is located in the Newaukum River upstream from the Chehalis River. A secondary drinking water intake is located in the Chehalis River upstream from Dillenbaugh Creek.

The hydrostratigraphic units at the Site, from bottom to top, are described below.

- Lower Hydrologic Boundary Unit. Comprised of siltstone bedrock; laterally continuous across the Site at approximately 45 feet below ground surface. Serves as a no-flow lower boundary for the groundwater system.
- Principal Water-Bearing Unit. Comprised of the coarse-grained Newaukum Terrace unit and directly overlies the siltstone bedrock. This unit is approximately 5 to 15 feet thick beneath most of the facility. Within the treatment area, the unit extends from near ground surface to bedrock for a total thickness of 35 to 45 feet. Isolated stringers of more permeable material are also likely present within the low-permeability unit of the Newaukum Terrace.
- Low-Permeability Unit. Comprised of the fine-grained Newaukum subunit and undifferentiated silt. Occurs as a thick massive stratum or laterally discontinuous lenses within the principal water-bearing unit. The thick massive stratum overlies the water-bearing unit beneath most of the facility including the landfill, mill, and west of the railroad tracks and serves as a semi-confining layer where present. In the treatment area, where the principal water-bearing unit extends to nearly the surface, the low-permeability unit consists of laterally discontinuous lenses causing unconfined aquifer conditions. The margin between the massive portion of the low-permeability unit and discontinuous lenses is likely complex with interfingering layers of high- and low-permeability material.

- Anthropogenic Fill. Variable in thickness, texture, and grain size. Granular fill in the treatment area is 4 to 6 feet thick and consists of clayey gravelly sand. The landfill contents range from cobble-size gravel to sawdust, wood chips, timbers, metal fragments, and tires. Fill accumulated in the stormwater discharge lagoon consists of very soft, fine sediment and organic matter. Hydraulic properties vary widely.

History of Contamination

From the early 1930s to 1985, ACC conducted wood cutting and milling operations. Wood waste, a waste stream from the milling operation, was placed in the wetland creating a landfill. Non-contact cooling water and boiler blow down from the mill operation were drained to the wetland. Other waste streams released from the facility may have included lubricating oils, diesel and gasoline.

Wood treating began in the early 1930s. Crossarm and conduit for electrical utility poles were treated in open dip tanks with hot or cold creosote and PCP. Tank sludge is suspected to have been disposed of in the landfill. Solvents, paints, paint thinners, lubricating oils, petroleum products, and other miscellaneous wastes may also have been disposed of in the landfill. The landfill was not designed, constructed, or operated in accordance with current landfill practices.

ACC changed its treatment operation to a pressure-treating process which was constructed north of the kilns. The operation included a chemical makeup area, two pressure retorts, a vapor recovery system, a separation tank, two sumps, a surface impoundment, and a drag out area for drying treated lumber. The chemical makeup consisted of an operation in which solid PCP was mixed with diesel to make a 5% PCP solution. Contamination during plant operations resulted from the wood treatment process primarily through five methods:

- Discharge of liquids from the vapor recovery system to the city stormwater sewer, which subsequently discharged to the stormwater discharge lagoon west of the facility.
- Discharge of wastewater from the process building sumps to the surface impoundment.
- Removal and disposal of sludge from the bottom of the surface impoundment to the landfill south of the mill.
- Dispersion of contaminants in the treatment works tanks, pipes and sumps around the facility due to flooding.
- Miscellaneous leaks and spills around the facility.

Wood from the mill was dried in kilns until 1983. Discharges from the kilns may have contained wood lignin, tannic acids, and other naturally occurring wood constituents. The kilns are believed to have been heated by burning scrap wood and other combustible material (although auxiliary diesel fuel was available). Asbestos containing materials and electrical equipment containing polychlorinated biphenyls were also present in the mill, but were removed in 1992. Property to the east of the facility previously housed milling operations. Historical air photographs indicate that these facilities were torn down between 1960 and 1974. The demolition debris was placed in the landfill south of the mill.

Initial Response

Early Investigations

In early 1983, the Washington State Department of Ecology (Ecology) conducted a compliance inspection of the ACC facility. The inspection determined the facility was not in compliance with State waste handling requirements. Ecology required ACC to eliminate discharges of wastewater to the environment, to prepare a wastewater treatment and disposal plan, and to redirect all boiler blow down to the sanitary sewer collection system. In late 1983, ACC stopped the wood milling and treatment operations.

Early Actions and Enforcement Activities

Several floods occurred in the next few years, releasing contamination to the surrounding area. In 1986, the Chehalis River flooded ACC spreading approximately 10,000 gallons of PCP-diesel solution to the Chehalis Avenue area and potentially to the wetlands and Dillenbaugh Creek. An emergency CERCLA action was taken to cleanup contamination from this flood. Contaminated soil, debris, furniture, and other material generated from the cleanup, that was considered the principal threat to human health and the environment, were stored on the facility. In 1988, an incinerator was brought on the facility to incinerate the contaminated material, generating approximately 207 tons of ash. Prior to that in 1987, contaminated sludge and sediment were removed from the surface wood treatment impoundment and also incinerated.

Additional Actions

In 1991 and 1992, EPA undertook an action to further reduce the potential for spread of contaminants. In 1991, clean imported gravel was spread over the former wood treatment area to keep fugitive dust containing wood treating chemicals from becoming airborne. Above ground tanks and piping in the treatment works were decontaminated and the steel taken to a recycler in 1992. Laboratory chemicals and PCB-containing electrical equipment were collected from various buildings and secured by placing them in overpacks. Asbestos was removed from exposed pipe and placed in sealed drums.

Remedial Investigation/Feasibility Study

In 1989, EPA initiated a remedial investigation and feasibility study (RI/FS). The FS was completed in September 1992. The RI/FS identified several contamination sources, types of contamination and affected media. Surface soil was contaminated due to previous flooding, subsurface soils were contaminated through past facility operations, groundwater was contaminated through past facility operations and floating product was observed, and surface water and sediments in Dillenbaugh Creek and the stormwater lagoon were contaminated due to previous flooding and past operations at the facility.

Soil

PCPs, carcinogenic polyaromatic hydrocarbons (cPAHs), and polychlorinated dioxins and furans (PCDD/F, or collectively dioxin) were found in surface soil (0-6 inches) in the majority of the areas sampled during the Remedial Investigation (RI). Surface soil within the treatment area contained the highest concentrations of contaminants; however, areas of elevated concentrations were found to the north and east and these appeared to correlate to the boundaries of previous flood events.

PCPs, cPAHs, and dioxins were also found in subsurface soil at the treatment area, mill area, landfill area, and stormwater discharge lagoon during the RI. Again, the treatment area contained the highest concentrations of contaminants.

Groundwater

A conceptual hydrologic model for the northern portion of the Site as presented in the RI is illustrated schematically in Figure 4. In this model, rainwater percolates into the principal water-bearing unit through the exposed unit in the treatment area and north and east of the facility. The water flows downward until it encounters the lower hydrogeologic boundary unit at a depth of about 45 feet. The groundwater then flows southwest beneath the thickest portion of the low-permeability unit. At the southern portion of the Site, a low-permeability layer is present up to 25 feet thick, which limits the vertical migration of groundwater to the principal water bearing unit.

Most of the groundwater in the principal water-bearing unit flows to the southwest toward the Chehalis/Newaukum river system where it is discharged. However, some water may escape to the surface through gravel stringers, which outcrop near the kiln and may connect to the wetland south of the facility. Discharge of groundwater to the west of the Site via stringers is also possible but less likely due to the massive character of the silt deposits.

Groundwater may also move within the anthropogenic fill units such as the landfill; however, since continuous saturated zones were not found, groundwater does not appear to move laterally in response to a pressure gradient. Instead it tends to move downward by gravity flow along perched surfaces. Some water may collect in local stratigraphic lows. The remainder presumably drains outward along the perched surface until it is intercepted by streams, wetlands, or ditches adjacent to the Site.

During the RI, groundwater contamination was discovered at three discrete areas within the treatment area: under the treatment works, near the surface impoundment and southwest of the kilns. Figure 5 shows the locations were contaminants were detected at elevated concentrations. A description of the contamination is presented below.

- Treatment works. PCP was present in a dissolved phase and as a constituent in a diesel LNAPL.
- West of kilns. Groundwater was contaminated with PAHs and benzene, toluene, ethylbenze and xylene (BTEX).
- West of the surface impoundment. Groundwater was contaminated with PCP.

Groundwater contamination was also identified in isolated portions of the landfill, likely a result of percolation through the landfill deposits. The low-permeability unit is present as a massive stratum up to 25 feet thick beneath the landfill. The presence of this layer likely causes perched groundwater that could discharge to the wetlands south of the landfill. This low-permeability layer will also limit the vertical migration of groundwater contaminants into the principal water bearing unit. For these reasons, monitoring of groundwater at or down-gradient of the landfill was not continued after the RI.

Surface Water
Surface water samples were collected from the Chehalis River, Dillenbaugh Creek, and the stormwater discharge lagoon. PCP and PAHs were detected at the discharge lagoon and in Dillenbaugh Creek down-stream from the discharge lagoon. Dioxins were found in the discharge lagoon, Dillenbaugh Creek, and the Chehalis River

Sediments in Dillenbaugh Creek
Sediment samples were collected from Dillenbaugh Creek, the stormwater discharge lagoon, wetlands, and the Chehalis River. The major contaminants found were dioxins, PAHs, and PCP. The highest concentrations were observed at the stormwater discharge lagoon and in Dillenbaugh Creek immediately downstream of the stormwater discharge lagoon.

1992 Risk Assessment

Human Health Risk Assessment
The risk assessment in the 1992 RI determined that the greatest risk for adverse health effects to humans was through incidental ingestion of dioxins and PAHs in soils on-Site and in selected residential areas. A summary of the exposure pathways considered during the assessment is as follows:

- Incidental ingestion of soil and dust at the facility and in the adjacent residential area.
- Inhalation of particulate matter at the facility and in the adjacent residential area. The risk from this pathway was calculated to be less than 10^{-6}.
- Incidental ingestion of water and sediment while playing and swimming in Dillenbaugh Creek. The risk from these pathways was calculated to be less than 10^{-6}.
- Dermal absorption from contaminants in Creek sediments was not evaluated.
- Groundwater. Not evaluated because it is not used for drinking water and deed restrictions were anticipated to prevent any future exposure.
- Human consumption of fish or invertebrates in Dillenbaugh Creek. Not evaluated because Dillenbaugh Creek was not considered to be a viable fishery.
- Consumption of waterfowl that feed in the area. Not evaluated since they would only be present seasonally.
- Dermal absorption of contaminants in soil and ingestion of fruits and vegetables grown in the area. This pathway was only evaluated in the uncertainty analysis.

Ecological Risk Assessment

- Potential for negative impacts exist, but the severity is unknown due to the uncertainties in the exposure assessment approach used.

IV. Remedial Actions

Remedy Selection

The ROD for the ACC Site was signed on June 30, 1993. The remedial action objectives (RAOs) for the selected remedy were designed to remove the potential threats to public health and the environment by significantly reducing the volume of contaminated soil. The contaminants of concern were cPAHs and dioxin.

The RAOs include:

- Protect human health in the Chehalis Avenue area by excavation of contaminated soil to meet MTCA Method B (residential) cleanup standards.
- Protect human health from physical and chemical hazards from the facility by demolition and removal of facility structures.
- Protect human health and the environment by source control through excavation of ACC facility soil from the most highly contaminated areas, and meeting Washington State Model Toxic Control Act (MTCA) cleanup standards through containment and institutional controls. Resource Conservation and Recovery Act (RCRA) subtitle C requirements are not applicable to remedies on the facility or within the area of contamination because the contaminants were not listed at the time of release, and because contamination of the environmental media remaining after the action is low level. Also, RCRA subtitle C requirements and the State of Washington minimum functional standards for landfills are not relevant or appropriate to remedies at the facility because the requirements are not well suited to the Site or Site conditions. For example, no leachate has been identified although the Site is located in a flood plain which is frequently inundated, depth to groundwater is less than 10 feet, etc.
- Protect the environment through removal of contaminated sediment in the lagoon and stormwater sewer to meet ambient water quality criteria (AWQC) and MTCA cleanup standards for surface water in Dillenbaugh Creek.
- Protect human health and the environment by removal of the floating product underneath the treatment works to reduce groundwater concentrations of contaminants of concern (COCs) to meet Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) and MTCA clean up levels for groundwater at the facility boundary.
- Disposal of the most highly contaminated excavated material at an approved off-Site hazardous waste landfill. A hazardous waste designation is relevant and appropriate for off-Site transportation and disposal of soil and debris from the facility.

Remedy Implementation

In September 1994, remedial construction activities commenced to implement the selected remedy in the ROD. The following describes these activities.

General Facility Support

Construction of the general facility support area included office building demolition, contaminated soil excavation, clearing and grubbing, construction of the haul road, construction of the decontamination pad and secondary containment area, and utility installation.

Site Debris Removal

The Site debris removal and consolidation work consisted of removal of various piles of wood debris located throughout the Site. The wood, determined to be non-hazardous by sampling and analysis, was taken to a local landfill for disposal.

Drum Removal
Off-Site disposal of drums was conducted after contents were properly identified and the disposal Site was verified appropriate for the designated material.

Structure Demolition
Mill concrete footings were dropped into the mud under the former mill and incorporated into the sub-grade to provide stability. Salvaged steel was transported to a metal recycler. Clean non-contaminated salvaged timber in reasonable condition was processed and inventoried at a local yard and sold to the public or sent elsewhere for use. Wood of lower quality was sent to a recycler to be used for fiber recovery or as boiler fuel. Wood debris was also sent to a local non-hazardous landfill for disposal.

The treatment works and kiln boiler room buildings were demolished and the resulting debris sent to a hazardous waste landfill. This debris was handled as hazardous waste due to severe staining and saturation with wood treating compounds. Clean concrete from the treatment works building foundation was broken into 1-foot pieces and buried near the kilns to provide sub-grade stability.

Storm Drain Cleaning and Relining
A dam was built across the storm drain outlet section of the lagoon with cement blocks. This part of the lagoon was pumped dry before a camera was sent through the drain pipe for a television inspection of the pipe's internal conditions. The 36 inch stormdrain line was then cleaned and videotaped before installing the Cured-In-Place-Pipe (CIPP). The required length of the CIPP was measured (830 feet) and transported on-Site packed in ice. The CIPP placed in the storm drain consisted of a 12-mm-thick polyester fabric impregnated with resin.

The pipe was placed inside the existing drain using hydrostatic pressure from a water column outside the manhole. Once the pipe was placed, the water inside the pipe was heated to activate the resin and cure the pipe into a rigid lining. A post-installation television inspection was performed on the completed drain pipe to verify the integrity of the relined pipe.

Lagoon Sediment Removal/Restoration
The city surface water lagoon is located at the outlet of the storm drain flowing east to west across the ACC Site. A temporary bypass lagoon to accept future stormwater run off was constructed and a sheet pile isolation wall was installed at the outlet of the original lagoon, isolating it from Dillenbaugh Creek. A water treatment system consisting of filtration and carbon adsorption was installed to treat wastewater, pumped from the now isolated lagoon.

Approximately twenty 20,000-gallon tanks were brought on-Site and set in a secondary containment cell during the remedial construction activities. Surface water in the lagoon was pumped to the tanks and then treated. Wastewater generated from lagoon and sediment dewatering was treated to meet AWQC and then discharged to Dillenbaugh Creek.

Sediments were excavated to clean native soil. The sediment was de-watered, blended with cement kiln dust and transported to a RCRA hazardous waste landfill. The sheet pile isolation wall was removed. Erosion control matting was placed over the reconfigured banks and the bypass system was removed allowing water to flow through the reconfigured lagoon. The lagoon area was hydroseeded. The temporary lagoon was backfilled. The bypass manhole and 30-inch metal culvert were left in place.

Tank and Pipe Removal
The four on-Site tanks were reportedly 1,000, 6,000, 6,000, and 10,000-gallon in size and contained diesel, creosote, creosote and process residuals, respectively. The tanks and associated piping were removed and cut into pieces and taken off-Site to a steel recycler.

The residual sludge within the tanks was removed for off-Site disposal at a hazardous waste landfill.

Facility Soil Removal
Soil excavation was performed on the most highly contaminated surface and subsurface soil as determined by sampling performed during the RI. The approach taken was to excavate to the design depths or until the clean native clay (unweathered or visually free from stain or oxidation) was observed.

The bottom of the excavations in the treatment and kiln areas were visually observed to be clean light brown clay. The area behind the kilns was excavated to depth, where clean blue clay was encountered. The light brown clay and blue clay visually signified that the stained contaminated soil had been removed down to clean soil. The wood treatment impoundment area excavation was based on an alternative optimization evaluation performed in the feasibility study from the subsurface soil sampling conducted in the remedial investigation. It was determined that 70% of the total contamination could be removed by excavating 25% of the soil. This approach optimized the balance between contamination removal, treatment, and cost, consistent with Washington Administrative Code (WAC) 173-340-360(5)(d).

Soil was excavated and stockpiled in an area directly in front of the former kilns in a pile approximately 15 to 20 feet high and 150 feet long. In almost all places in the treatment works and kiln area the bottom of the completed excavation was visually observed to be clean brown clay. A total of 18,137 cubic yards of soil on the ACC facility was excavated and transported off-Site for disposal.

After demolition of the mill structures, a small area of surface soil was found that had creosote contamination associated with leaks and drips from a former creosote drip tank located in the former mill. The area was approximately 20 feet wide by 20 feet long and was located under the northwest corner of the mill. The soil was excavated from this area and segregated from the PCP contaminated soil. Determination of extent of excavation was made by visual observation. This soil was disposed off Site as hazardous waste. Wastewater generated from decontamination and other on-Site activities was either used for dust suppression on the contaminated soil or was filtered to meet City of Chehalis public-owned treatment works (POTW) permit requirements and discharged to the POTW. Most of the decontamination water was used for dust suppression. Minimal floating product was observed in the excavations. No floating product was found in the 10 foot deep excavation under the treatment works. A small quantity of dark thick oil (< 1 gallon) was seen floating on the water in the 10-foot-deep excavation under the former surface impoundment. This oil was soaked up using oil absorbent pads. The pads were disposed off-Site at the hazardous waste landfill used for soil disposal. Figure 6 shows the final excavation depths.

Residential Soil Removal/Restoration

Soil in 26 residential lots was excavated to a depth of approximately 8 to 12 inches. Soil sampling was completed prior to excavation to determine the residual soil contamination at each residence. Table 2 (included in section VIII. Technical Assessment) shows the ROD cleanup levels used.

Soil excavated from yards was loaded into dump trucks and placed temporarily near the north end of the ACC landfill. Approximately 2,500 cubic yards of soil was excavated from residential lots. When excavation in a lot was complete, the lot was filled with clean imported topsoil and re-sodded. The contaminated yard soil was later buried in the excavated impoundment area.

Monitoring/Production Well Abandonment

One on-Site production well and several groundwater monitoring wells were abandoned as part of the remedial activities. The wells were abandoned in accordance with Washington State Regulation (WAC 173-160) by a driller licensed in the State of Washington.

Facility Backfilling and Grading

As specified in the ROD, ash from incineration of contaminated materials (soil, wood, debris and other miscellaneous items contaminated from flooding in 1988 and 1989) were consolidated with the Chehalis Avenue residential soil. This ash was determined by Ecology and EPA to be non-contaminated. The consolidated soil and ash were used to backfill excavations under the treatment works and surface impoundment. The ROD also required the entire facility to be covered with clean topsoil, properly sloped and contoured and re-vegetated with grass. Covering the entire facility with clean soil and re-vegetation protected human health by eliminating soil ingestion, dermal contact, and dust inhalation pathways. The excavated areas in the treatment works were filled to an elevation approximately 2 feet below street level with imported fill and 6-inch stones in addition to the consolidated soil/ash mixture. The round stone was used to stabilize the soft soil and provide a stable sub-base.

The soil underneath the former mill area had such little structural strength that six-inch round stones were also mixed with the soil to provide stability. The stone was added to the soil up to the edge of the standing water that eventually formed a small on-Site pond/wetland habitat which drained to the existing wetland. After the mill and treatment area had been stabilized and cut to proper subgrade, geotextile was placed over these areas. The geotextile was used to provide additional stability to the subgrade and keep the soil from pumping through the clean imported fill. All areas of the Site including the landfill were rough-graded and covered with 1 foot of pit-run gravel. Once these areas had been covered and graded, 6 inches of topsoil was placed over the fill, graded, hydroseededed, and fertilized. Figure 7 shows the final as-built of graded and capped areas.

Institutional Controls

In 1997, an Administrative Order on Consent for Use and Maintenance (AOC) was entered between EPA and the current property owner. The purpose of the AOC was to ensure that activities on the property conform to the requirements established by EPA to protect public health and welfare and the environment. The terms and obligations of the AOC require among other things:

- That all transactions involving the transfer of an interest in the property are subject to the AOC and provides that all successors, heirs, agents, representatives, assigns, transferees, and lessees be bound by the AOC.

- Use restrictions described in the Protective Covenants below.
- Maintenance requirements.

The Protective Covenants provide for the following use restrictions:

- Installation of groundwater wells is prohibited.
- Rezoning of the property for agricultural or residential development is prohibited.
- Intrusive activity (subsurface excavation, utility maintenance/repair, etc.) is restricted with the following controls:
  - Activities that may breach the cap may not occur without the prior approval from Ecology or EPA.
  - Owners and workers are subject to Washington Labor and Industry Safety and Health requirements.
  - Generation, transportation and disposal of any excess subsurface materials maybe subject to Washington Dangerous Waste requirements.

The AOC and Protective Covenants were recorded in Lewis County in 1997 in association with the parcels that comprise the ACC Site.

Construction Completions

Pre-final and final Site inspections were conducted with EPA, Ecology and the contractor on April 17, 1996 and May 14, 1996 respectively, to insure that all phases of the construction were satisfactorily completed and to insure that the response action was fully implemented to meet the ROD requirements.

On August 12, 1996, Ecology sent EPA a letter, in which they assumed responsibility for the Site operation and maintenance and acknowledged the Remedial Action Objectives had been accomplished in a satisfactory manner.

No remediation of Dillenbaugh Creek occurred during the remedial action. The ROD states, "...the creek water contamination will be reduced by removing the source of contamination. Removing the majority of contaminated soil, covering the area with clean soil, and re-vegetating will significantly reduce contaminated surface runoff which will reduce PCP, PAH and dioxin loading to the creek."

Operation and Maintenance

An operation and maintenance (O&M) plan was approved by EPA in June 1996. The primary activities associated with O&M include annual inspections, maintaining established institutional controls, and routine monitoring and laboratory testing of groundwater for at least the first five years after clean up was completed. Ecology has responsibility for these O&M activities. Lewis County Department of Health and EPA provide assistance and counsel on the remedy's effectiveness and corrective actions when required. Figure 3 shows the current Site map and Figure 8 shows the O&M inspection locations.

Annual inspections

These inspections include monitoring and maintaining the perimeter fence, visual inspection of the vegetative and soil cover, inspecting drainage swales for erosion, inspection and maintenance of the groundwater monitoring well system, and visual inspection of the stormwater lagoon for erosion and outfall blockage.

The perimeter fence, the soil cover and drainage swales on the former mill and treatment areas are no longer present due to the recent development of the Site. Per the O&M plan, responsibility of the stormwater lagoon inspections would revert to the City of Chehalis after the first year following completion of the remedial action. According to City of Chehalis Public Works personnel, inspections of the stormwater lagoon occur quarterly with additional inspections during storm events or periods of high rainfall.

Institutional Controls
Per the O&M plan, institutional controls need to be examined each year following the completion of the remedial action to ensure the appropriate restrictions remain applicable and in-place.

Routine Monitoring
Per the O&M plan, groundwater monitoring needs to have occurred annually for the first five years after remedial action; with subsequent monitoring being determined after the first five years of data is collected. Groundwater samples from four wells need to be analyzed for pentachlorophenol (PCP) and carcinogenic PAHs. PCP analysis will provide a surrogate measure for the presence of dioxins. Surface water, if collected and analyzed, needs to be analyzed for only PCP.

No annual inspections have occurred since the Second Five Year Review, except for quarterly visual inspections of the stormwater lagoon by the City of Chehalis. Since much of the Site has changed in recent years, the O&M plan needs to be updated to reflect current conditions.

V. Progress Since the Last Five-Year Review

The Second Five-Year Review Report identified two issues for follow up action. See Table 3. *Progress Since Last Five-Year Review.*

Table 3. Progress Since Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome
Monitoring frequency and well needs should be assessed and a decision about replacement should be resolved	As part of O&M obligations, Ecology to determine if continued groundwater monitoring is warranted.	Ecology	March 15, 2005	No action taken
Dioxin survey for Dillenbaugh Creek should be followed up to determine need for further action	Ecology to resolve these issues	Ecology	March 15, 2005	Additional sampling conducted in 2004. However, no determination of action resulted from the additional sampling.

No additional progress has occurred since the last five-year review.

VI. Five-Year Review Process

Administrative Components

The team lead for the ACC Site Five-Year Review is Anne McCauley, the EPA Remedial Project Manager (RPM), Region 10. The review team included personnel from the USACE, Seattle District. Sharon Gelinas and Marlowe Laubach, both with the USACE, Seattle District, assisted with the review as representatives of the support agency. By November 2008, the review team had been formed, and had established the review schedule and its major components, including:

- Document Collection and Review;
- Data Assessment/Analysis;
- Site Inspection;
- Interviews and Community Notification and Involvement; and
- Five-Year Review Report Development and Review.

The Third Five Year Review Report has a statutory completion date of September 30, 2009.

Community Involvement

There has been no recent community involvement action on the part of Ecology or EPA, nor has there been any interest expressed from the community regarding the Site in the last five years. Community interest in this Site has been, and continues to be, low.

A public notice of the start of the Third Five-Year Review was placed in the Chehalis Chronicle on August 1, 2009.

Document Review

This Five-Year Review consisted of a review of relevant documents as summarized in Attachment 3. Applicable groundwater, surface water and soil cleanup standards were also reviewed.

Data Review

Since groundwater and surface water data have not been collected since the Second Five-Year Review, historical data that were collected following the completion of the remedial action were reviewed to determine if monitoring activities should be continued.

Groundwater

All monitoring wells at the facility were decommissioned during the remedial activities with the exception of five down-gradient, off-Site wells (MW-22, MW-23, MW-24, MW-25, and MW-26), which are used as performance monitoring locations. These performance monitoring wells were appropriately located in the down-gradient direction from the treatment area to detect any contamination that may have migrated off-Site. In addition, wells MW-23, MW-24, and MW-26 were located in the vicinity of the storm drain that could act as a preferential pathway for groundwater contaminants. There were no performance monitoring wells located down-gradient from the landfill because there was little evidence during the RI that the shallow, perched groundwater contamination at the landfill was connected to the principal water-bearing unit.

Figure 5 shows the location of the performance monitoring wells, general groundwater flow direction, and locations of elevated levels of Site contaminants detected during the RI. All groundwater samples were analyzed for PCP and carcinogenic PAHs. The PCP analysis was used as an indicator for the possible presence of dioxins. Dioxins were not analyzed unless PCP concentrations exceeded the cleanup levels specified in the ROD. The four wells closest to the facility (MW-22, MW-23, MW-24, and MW-25) were designated for annual sampling during the five-year performance monitoring period. The first sampling event took place in 1997. Due to problems with subsidence and well damage, MW-23 was decommissioned in 1998 and MW-22 and MW-24 were decommissioned in 2000. MW-26 was subsequently added to the monitoring program in 2000. The remaining two wells, MW-25 and MW-26, were last sampled in 2001. As discussed below, a monitoring well reconnaissance revealed that MW-25 is damaged and only MW-26 is currently capable of being sampled.

Attachment 4 presents the constituents detected during the performance monitoring period along with their current MTCA Method B cleanup levels for groundwater. Low levels of PAHs were detected, but none of them exceeded cleanup levels. These results are consistent with those observed during the RI at the same wells; low levels of PAHs and volatile organic compounds (VOCs) were detected, but none of them exceeded cleanup levels.

A review of the geologic conditions and historical groundwater data indicate that migration of residual soil contaminants is limited by the geology/hydrostratigraphy at Site. The selected remedy removed the most contaminated soils from the treatment area, where there was the highest potential for migration.

Ponded Surface Water

Ponded surface water samples from the facility were collected annually from 1997 through 2001 even though they were not specifically required in the ROD. The 1996 Maintenance and Monitoring Plan states: "..if ponded water is observed at the Site, Ecology may design and implement a sampling program." Similar to the groundwater samples, all surface water samples were analyzed for chlorinated phenolics and carcinogenic PAHs.

Figure 9 shows the location of the two surface water samples. ACCSW-1 was collected at the outlet of a small seasonal pond which received runoff from the north half of the Site. ACCSW-2 was collected at a wetland area at the south end of the Site, adjacent to the landfill and railroad tracks adjacent to the ACC Site. Surface water samples were not historically collected from these locations; however, surface soils collected near these locations during the RI contained low levels of PAHs. The surface water collected at these locations ultimately discharges to Dillenbaugh Creek. It should be noted that, in general, PAHs have low solubility and tend to adhere to organic matter in soil and sediment. Therefore, a turbid water sample may give high-biased PAH results. Also, the wetland to the south of this seasonal pond would filter out soil and sediment to which PAHs tend to adhere. In addition, PAHs are common anthropogenic contaminants found in the environment. Without data from areas with no potential to be contaminated by the facility (i.e., background areas), it is difficult to determine the source of the PAHs present in these 2 samples.

Attachment 5 presents the constituents detected during the performance monitoring period and the 1992 Washington State Water Quality Standards (WQS). PAHs were detected in the surface water samples. None of the concentrations exceeded the aquatic acute or chronic water quality standards.

However, there were several exceedances of the WQSs for human health. Most of these exceedances were for individual carcinogenic PAHs (cPAHs) (the standards assume that all carcinogenic PAHs are equal in cancer potency to B(a)P (benzo(a)pyrene)). Exeedances also occured using the Toxic Equivalency Factor (TEF) approach to calculate B(a)P equivalent surface water concentrations (TEF Adjusted Carcinogenic PAHs). There are also a smaller number of exceedances of the human health WQS for pentachlorophenol

Several prospective sources for PAHs exist near these surface water sample locations including the railroad tracks adjacent to the sampling locations, runoff from the northern portion of the Site, residual surface soil contamination in the wetland area, or perched leachate from the landfill. If ponded surface water samples are collected in the future, it is recommended that off-Site samples adjacent to the railroad ditch and background samples be collected for comparison.

Dillenbaugh Creek Sediment Sampling
As part of a screening level study to determine if residual contamination remained in the area near the ACC Site, Ecology collected sediment and fish samples from Dillenbaugh Creek in 1998. A follow-up study was completed in 2004. The Ecology studies determined that dioxin/furan concentrations downstream of the ACC Site were significantly higher than background areas in Dillenbaugh Creek and the Chehalis River. Dioxin and furan concentrations were also significantly higher in fish tissue from Dillenbaugh Creek than from the Chehalis River and Ecology concluded that fish contaminant levels "could be a concern for the protection of human health". Figure 10 presents the data from the 1998 Ecology study along with data from 1986 and 1991 (RI) and Figure 11 presents the data from 2004.

The elevated dioxin/furan concentrations may be a result of activities from the ACC Site; however, when the deposition occurred for these contaminated sediments is very uncertain. Much of the Dillenbaugh Creek streambed is a scoured hard clay bottom. Contaminated sediments could have accumulated in ponded areas downstream of the stormwater lagoon before or after the lagoon restoration. Some of the contaminated sediment pockets may have originated as stream bank soil (contaminated prior to the lagoon restoration) that has broken loose and fell into the creek. In addition, flooding since the restoration may have re-distributed residual contamination in Dillenbaugh Creek. The City of Chehalis currently uses the lagoon as part of its stormwater system, adding to the depositional timing uncertainty

Groundwater well information
As of the 1992 RI, 33 domestic, irrigation, and municipal wells were located within a two mile radius of the facility. The majority of these wells were located in the outlying areas of the City to the south and southwest, and were geographically separated from the facility by the Chehalis and Newaukum Rivers. According to well logs provided by Ecology, well water levels ranged from 30 to 110 feet below ground surface, with approximately 75% of the wells used for domestic purposes. The wells closest to the facility (within a 1/4-mile radius) were used for irrigation only.

As of December 2008, the Washington State Department of Ecology shows over 170 domestic, irrigation, and municipal wells located within a two mile radius of the facility. Figure 12 shows that the majority are located in the outlying areas and are geographically or hydrologically separated from the facility. General groundwater flow direction is to the southwest and all wells except one are located cross-gradient to groundwater flow from the ACC site. The closest down-gradient wells are over 2000 feet away and are used for irrigation only. Nearby down gradient monitoring wells have not detected ACC contaminants above MTCA level B concentrations.

Institutional Controls
A title search was conducted in March 2009 for each of the three parcels comprising the former ACC Site (Attachment 6, *Commitment for Title Insurance).* A review of the title search results was conducted and the results documented in Attachment 7, *Title Exceptions Review.*

All three parcel titles have the 1997 AOC and associated Protective Covenants recorded in Lewis County as required by the AOC. At least two deeds executed subsequent to the AOC date do not contain the use restriction language; however, title records confirm the restrictions remain in effect for all three parcels. Full exercise of two easements (one for a 10" sewer line and one for a water line) executed subsequent to the AOC could impact the clean cap installed as part of the ACC cleanup. In both cases, EPA Protective Covenants supersede the easement. For relative locations of the easements and clean cap see Figure 13, *Current American Crossarm Site Cap and Encumbrance Locations and Parcel Boundaries.*

Site Inspection
A Site inspection was conducted on January 22, 2009. The inspection team included Anne McCauley, EPA Remedial Project Manager, Dom Reale, Washington Department of Ecology Site Manager, and the USACE Five-Year Review team. The Site Inspection Checklist is provided as Attachment 8. The inspection consisted of a Site visit, where the team observed existing Site conditions. The following summarizes the observations made during the Site inspection.

- The areas of the former facility are now developed with two buildings, associated parking lots, and a storm drainage basin.
- Elevation of the development is higher than adjacent street due to the placement of additional material on top of the cap placed during the 1996 remedial action.
- The landfill is currently intact and undeveloped. Debris from the 2007 flood event was observed on top of the landfill.
- The surface water adjacent to the landfill appeared to be have been widened. A sheen was observed on the surface water on the southwest side of the landfill adjacent to the railroad tracks.
- No fencing was observed surrounding the former facility.
- The stormwater lagoon to the west of the former facility is still intact and directly discharges into Dillenbaugh Creek.
- Monitoring wells could not be located due to the heavy vegetation.

A monitoring well reconnaissance was conducted on March 3, 2009. The reconnaissance team included Sharon Gelinas, from the USACE Five-Year Review team, and Pam Marti, Hydrogeologist, from Ecology. Both of the remaining wells, MW-25 and MW-26, were located. MW-25 was observed to have experienced uplift, resulting in damage, and should be appropriately decommissioned. MW-26 was observed to have some ground subsidence beneath the protective concrete slab, but still appears to be in satisfactory condition. Photos of the wells are presented in Attachment 2.

Interviews

Owners of all three parcels comprising the former ACC Site were interviewed either in person during the Site inspection or via phone. All three property owners appeared well aware of the history of the properties, of the CERCLA cleanup, and use restrictions that run with the land. Two current owners described the addition of 6-8 feet of fill over the cap at the former treatment and mill areas prior to development. One owner stated that the geomembrane placed on the cap was encountered during development but was not damaged. He also noted that during the 2007 flood, the northern most building still encountered at least six inches of water. The owner of the landfill (southernmost parcel) indicated an interest in developing the landfill area into office space and parking with the understanding that intrusive activity requires the approval of Ecology or EPA.

An owner representative of the parcel on which the remaining down-gradient monitoring wells are located was also interviewed. The representative was aware of the wells located on the property and why they were installed. The representative raised no issues relative to the continued use of the wells.

City of Chehalis Community Development Director, Mr. Bob Nacht was contacted at the kick-off the Five Year Review process. Mr. Nacht is familiar with the ACC cleanup, having worked with EPA and Ecology during the extensive cleanup activities. He is also aware of the Protective Covenants for the Site and limitations on intrusive activities that may impact the cap.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. The selected remedy was designed to remove the most highly contaminated soil from the Site and then rely on institutional controls to manage waste remaining at depth. Protective covenants and use restrictions are currently in place for the Site properties and property owners are managing their parcels in accordance with the protective covenants and use restrictions. However, maintenance inspections have not been performed by Ecology since 2001. Ponded surface water samples collected prior to 2001 indicate that low levels of PAHs were present near the landfill. Since alternative sources exist in this area, such as the railroad tracks, off-Site and background ponded samples should be collected if ponded surface water monitoring is conducted in the future. Sediment samples collected from Dillenbaugh Creek in 1998 and 2004 indicated the presence of dioxin sediment contamination in the Creek. There is uncertainty related to the source of this contamination, when it was deposited, if Dillenbaugh Creek sediments are currently contaminated, and if so, how it may be impacting human health and ecological receptors.

Institutional Controls

The AOC entered into in 1997 by EPA and the then owners of the American Crossarm Site required the property owners to record and abide by Restrictive Covenants. The owners were obligated to make these Restrictive Covenants "run with the land" and to also assure that EPA was named as a third party beneficiary with the right to enforce the Restrictive Covenants against a party who subsequently obtained an interest in the Site. AOC, sec. VII, para. C. In 1997, subsequent to issuance of the AOC, the owners recorded Protective Covenants which specify: that the covenants are to "run with the land"; that EPA may enforce the covenants; and that all persons who own the property are bound by the covenants. As a result, the owners appear to have met the above-referenced obligations of the AOC. Further, although the covenants are named "Protective" rather than "Restrictive", this alteration of title should have no discernible impact on the effectiveness of the covenants.

There is no grantee of the Protective Covenants. It is possible that this omission could impact whether a person who obtains an interest in the Site is legally obligated to comply with the covenants. Although the recording of the Protective Covenants provides notice to successors-in-interest of the restrictions at the Site, in order to address the risk that such a successor-in-interest could avoid compliance with the covenants, EPA could have the owners of the Site record a set of covenants which follows the Uniform Environmental Covenants Act (UECA) set forth in Chapter 64 of the Revised Code of Washington. However UECA covenants do not appear to be necessary for protectiveness.

The current state of each ROD objective and any indicators of remedy problems are described below.

1. Protect human health in the Chehalis Avenue area by excavation of contaminated soil to meet MTCA Method B cleanup standards. Contaminated soil was removed to Site-specific action levels at 26 residential lots during the remedial action.

2. Protect human health from physical and chemical hazards from the facility by demolition and removal of facility structures. All structures were removed from the Site during the remedial action and a soil cap was placed over the Site. Two buildings were constructed on the northern half of the Site. According to the property owners, 6 to 8 feet of additional fill was placed on top of the cap prior to their construction.

3. Protect human health and the environment by source control through excavation of ACC facility soil from the most highly contaminated areas and meeting MTCA cleanup standards through containment and institutional controls. The most highly contaminated areas of soil in the treatment area were removed during the remedial action. In addition, institutional controls are in place on the Site parcels so that intrusive activities are restricted, groundwater wells are not installed, and the property is not zoned for agricultural or residential development. The O&M Plan describes annual inspections and maintenance of the institutional controls. These inspections have not occurred in the past five years. Since the Site is now partially covered by additional fill and buildings, the O&M plan instructions may not be appropriate and the plan should be revised. The Site visit did not reveal any indication that intrusive activities had recently occurred and the protective cap as well as additional fill material are in place.

The 1992 Risk Assessment did not evaluate vapor intrusion in the event of Site development. A preliminary screening using EPA draft guidance (EPA 2002) indicates that chemicals of sufficient volatility and toxicity were present in the subsurface (PAHs: benzo(a)pyrene) prior to remediation to present potential vapor intrusion concerns. The most contaminated areas were excavated to a depth of 10 feet, backfilled and a soil cap with a geomembrane placed above these areas. Six to eight feet of additional fill was placed on top of the cap prior to construction of the buildings. However, for completeness and in accordance with EPA vapor intrusion guidance, if these chemicals are present within 100 feet of inhabited buildings, it is recommended that a vapor intrusion evaluation occur.

4. Protect the environment through removal of contaminated sediment in the lagoon and stormwater sewer to meet AWQC and MTCA cleanup standards for surface water in Dillenbaugh Creek. Contaminated sediments were removed from the stormwater lagoon during the remedial action. Follow-on sediment sampling by Ecology in Dillenbaugh Creek indicates that dioxins were present in 1998 and 2004 at elevated concentrations down-gradient of the stormwater lagoon compared to samples in the Creek upstream of the facility and samples from the Chehalis River. There is uncertainty related to the source of this contamination, when it was deposited, if Dillenbaugh Creek sediments are currently contaminated, and if so, how it may be impacting human health and ecological receptors.

5. Protect human health and the environment by removal of floating product underneath the treatment works to reduce groundwater concentrations of COCs to meet SDWA MCLs and MTCA cleanup levels for groundwater at the facility boundary. Floating product was removed during the remedial action. Migration of residual soil contamination to groundwater was monitored for five years following the remedial action at performance monitoring wells located down-gradient and off-Site. Contaminants have not been detected above MTCA cleanup standards or MCLs. However, only one of the original five monitoring wells that were used for the performance monitoring remains in suitable condition for sampling. This well should be sampled within the next year and then prior to subsequent Five-Year Reviews as a measure of groundwater protection.

6. Disposal of the most highly contaminated excavated material at an approved off-Site hazardous waste facility. The most highly contaminated material was appropriately disposed of during the remedial actions.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

To address this question, a review was done of the 1992 Baseline Risk Assessment for the Site and of the RAOs and cleanup levels listed in the ROD. See Attachment 9 - *Review of the 1992 American Crossarm and Conduit Human Health Risk Assessment and Evaluation of ROD Cleanup Levels and ARARs.*

Review of the 1992 Baseline Risk Assessment in the Remedial Investigation

(1) Human Health

The exposure scenarios, exposure assumptions, and toxicity data used in the risk assessment for human health (HHRA) were reviewed to ensure that they are still valid.

Four different scenarios were evaluated in the HHRA. Two of these, future residential exposure to the ACC facility treatment area and current trespasser exposure to the ACC facility treatment area, are no longer of concern as the ACC facility is capped precluding exposures for trespassers. Residential exposures to the ACC facility cannot occur due to land use restrictions. The other two scenarios, current residential exposure to the area bordering the facility (Chehalis Avenue area) and future industrial exposure to the ACC facility treatment area, mill and landfill areas, were evaluated in more detail.

For the current residential scenario, the toxicity values, exposure scenarios, and exposure assumptions used for the baseline risk assessment in the RI were reviewed to ensure that new scientific data and/or changes in EPA policy and/or guidance would not significantly impact the results of the risk assessment. Also reviewed was a supplemental risk evaluation done in 1995, approximately 2 years after the ROD was signed. In this supplemental evaluation, EPA performed additional risk calculations for the residential soil scenario using updated risk assessment methodologies and updated toxicity factors (primarily for cPAHs). This review was done to confirm that the cleanup areas outlined in the ROD for the residential area were still appropriate. Review of both the baseline HHRA and the supplemental risk evaluation concluded that changes in EPA science and guidance that have occurred since the remediation was done would not impact the protectiveness of the remedy in the residential soil areas. Attachment 9 provides more detail on this review.

For the future industrial exposure scenario, the risks from direct contact with surface soil (i.e., dermal contact, incidental ingestion, and inhalation of particulates and vapors outdoors) have been eliminated for these pathways as a result of the cleanup done at the Site. As previously discussed, the most contaminated areas were excavated to a depth of 10 feet, backfilled and a soil cap with a geomembrane placed above these areas. Floating product was removed from the groundwater. Six to eight feet of additional fill was also placed on top of the cap prior to construction of the buildings. However, indoor air exposure for current building occupants due to vapor intrusion has not been evaluated.

For the HHRA, several exposure pathways, including human consumption of fish or invertebrates from Dillenbaugh Creek, were discussed but eliminated from evaluation because it was assumed that "it is unlikely that significant exposure can occur now or in the future" from these pathways. The State of Washington water quality standards have a mix of designations in the Chehalis River Basin. Dillenbaugh Creek, which is in the Chehalis River Basin, is designated Core Summer Salmonid Habitat (which includes spawning) with Primary Contact Recreation. All free flowing waters in the State, including the Creek, are designated as "Harvesting" which includes fishing. As discussed above, Ecology 1998 and 2004 sampling for dioxins/furans in Dillenbaugh Creek sediments showed levels above background in the sediments downstream of the ACC facility in Dillenbaugh Creek and in fish samples from the Creek near the ACC facility taken in 1998. Based upon the dioxin/furan levels in a composite of Cutthroat Trout fillet from the 1998 Ecology sampling, the Dillenbaugh Creek is listed as impaired under the Clean Water Act §303(d) program. (The Creek is also listed due to fecal coliform levels and problems with temperature and low oxygen levels.) Based upon the State's use designation of "harvesting" and the possibility that contaminants in Creek sediments may bioaccumulate into fish tissue in the Creek, EPA recommends evaluating human consumption of fish as a follow up to this review for the ACC Site.

Although the use designation for Dillenbaugh Creek includes Domestic Water Supply Use, no one is using the water for this purpose. However, potential Applicable or Relevant and Appropriate Requirements (ARARs) for the Creek for the purpose of the Five Year Review include MTCA B regulations for surface water and the federal and state MCLs.

For this review, EPA evaluated risk from Dillenbaugh Creek sediments by screening the levels of dioxins in sediment against appropriate ARARs or risk based values (e.g., bioaccumulative sediment criteria and/or standards). While neither EPA or the State of Washington have such criteria or standards, the Oregon Department of Environmental Quality (ODEQ) has published *Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment* (http://www.deq.state.or.us/lq/pubs/docs/cu/GuidanceAssessingBioaccumulative.pdf). This document contains health protective risk-based Sediment Bioaccumulation Screening Level Values (SLVs). These SLVs were used to perform a preliminary assessment of the dioxin levels in Dillenbaugh Creek sediments. More detail on the ODEQ guidance and the screening done by comparing the ODEQ bioaccumulative SLVs to dioxin levels in Dillenbaugh Creek is in Attachment 9. The results of the screening show that the levels of chlorinated dioxin/furans in Dillenbaugh sediment downstream of the Site in 1998 and 2004 are not only elevated above sediments levels upstream of the Site and in the Chehalis River, but they are also well above ODEQ's risk-based human health SLVs for 2,3,7,8- TCDD.

In its 2002 Report which describes the results of the 1998 sediment sampling event, Ecology also included data for a small number of fish samples collected from Dillenbaugh Creek and the Chehalis River. The data show higher levels of chlorinated dioxins/furans in fish near the ACC Site than those from Dillenbaugh Creek above the Site or in the Chehalis River. The number and types of fish sampled are too small to screen for impacts to humans who may consume fish from Dillenbaugh Creek downstream from the Site. Ecology recommended in the 2002 Report that the potential for ongoing contamination of Dillenbaugh Creek from the ACC Site be evaluated.

(2) Ecological Receptors –

In the 1992 Risk Assessment, soil, sediment, and water contaminant concentrations and modeling algorithms were used to predict an exposure dose to the ecological species of concern. Following exposure predictions, a quotient method was used to estimate potential impacts. To evaluate potential ecological impacts, the area of contamination adjacent to the facility was divided into aquatic and terrestrial habitats (wetland, Dillenbaugh Creek, Chehalis River, storm water discharge lagoon), and indicator species were identified for each habitat. For the aquatic habitat, a cutthroat trout and a fish eating bird (kingfisher) were chosen as the species of concern; for the terrestrial habitat, a vole and a mallard duck were chosen. In the aquatic habitat, hazard quotients greater than 1 were estimated for the cutthroat trout and the kingfisher in the lagoon, for the upstream Dillenbaugh Creek, and downstream Dillenbaugh Creek areas. By contrast, the downstream portion of the Chehalis River and the areas chosen as reference for Dillenbaugh Creek and the Chehalis River had hazard quotients less than 1 for these species. In the terrestrial habitat, hazard quotients greater than 1 were estimated for the vole in the wetland. By contrast, the hazard quotients calculated for the mallard duck were less than 1 in all areas of the wetland. According to the 1993 ROD, "a deliberately conservative approach was taken so that potential impacts would not be underestimated. Results of this evaluation indicate the potential for negative impacts to ecological receptors exists, but the true magnitude or severity of these impacts is unknown due to the uncertainties inherent in the approach."

More recent methods are available to evaluate Site impacts to both aquatic and terrestrial species. EPA recommends further review of the uncertainties associated with the 1992 Risk Assessment evaluation of impacts to ecological receptors and applying updated methods and new data collected as appropriate to evaluate potential impacts from the ACC site on aquatic and terrestrial species.

Evaluation of ROD Cleanup Levels and ARARs

(1) Soil

Human Health
In the ROD, the human health cleanup objectives for soil in the facility and the residential areas were based on performance requirements that "were consistent with the numerical cleanup criteria of the MTCA regulations (Method B, residential)". The cleanup standards for soil in the ROD, which are shown in Table 2, are based on an acceptable cancer risk level of 1×10^{-6} for each chemical.

Changes have occurred to the MTCA soil cleanup levels since remedy selection. Some of these changes have occurred since the last five year review. In addition to some numerical changes in the MTCA Methods B soil cleanup values (see below), the new regulations clarify how the MTCA Method B cleanup values are to be applied to mixtures of cPAHs and dioxins/furans. The 2007 modifications to MTCA clarify that chlorinated dioxins and furans and carcinogenic PAHs are to be treated as single TEQ (Toxic Equivalencies) mixtures and that the TEQ concentration of the mixture must meet the MTCA B value set at a cancer risk of 1×10^{-6}. (A more detailed discussion of these MTCA changes is in Attachment 9.)

In 1993, when the ROD was signed, MTCA was silent as to how to evaluate cPAH and dioxin/furan mixtures; therefore, the decision on how to address these mixtures was made on a Site-specific basis. From the documentation provided on the ACC remediation, it is clear that for the ACC HHRA, the FS and the ROD, the TEF (Toxic Equivalency Factor) procedure was used to calculate 2,3,7,8-TCDD TEQ (Toxic Equivalencies); but for cPAHs, it was assumed that all cPAHs were as carcinogenic as B(a)P. A post-ROD risk evaluation was done (see discussion in Attachment 9) to incorporate EPA's new guidance recommending the use of TEF to calculate B(a)P TEQs. Therefore, compliance with MTCA was based upon the use of TEQs for both dioxins/furans and cPAHs. This is consistent with the 2007 MTCA modifications.

Table 2. ROD Cleanup Standards and Current Cleanup Standards

Chemical	cPAHs		Pentachlorophenol (PCP)		Dioxins/Furans	
Cleanup standard	ROD criteria	Current criteria	ROD criteria	Current criteria	ROD criteria	Current criteria
Groundwater						
Federal MCL (ug/L)	0.2*	0.2[a]	1.0*	1.0	$3.0x10^{-5}$*	$3.0x10^{-5}$[b]
State MCL (ug/L)	0.2*	0.2[a]	1.0*	1.0	$3.0x10^{-5}$*	$3.0x10^{-5}$[b]
MTCA Method B (µg/L)	.0.012 (0.3 ug/L)[c]	0.12[d]	0.73	7.3[e]	5.8×10^{-7} ($2.5 X 10^{-5}$)[f]	5.8×10^{-6}[g]
Soil						
MTCA Method B (mg/kg)	0.172[h]	0.14[i]	8.3	8.3	6.6×10^{-9}[j]	$1.1x10^{-5}$[k]
Surface Water						
State Water Quality Freshwater Standards for Aquatic Life Acute/Chronic (µg/L)	N/A*	N/A	5.49/3.46*[l]	5.49/3.46[l]	N/A*	N/A
Federal Ambient Water Quality Freshwater Criteria for Aquatic Life Acute /Chronic(µg/L)	N/A*	N/A	55/32	19/15	N/A*	N/A
Federal WQC for Human Health (ug/L)[o]	N/A+	0.0038[m]	N/A+	0.27	N/A+	5×10^{-9}[n]
State WQS for Human Health National Toxics Rule[o]	N/A+	0.0028[m]	N/A+	0.28	N/A+	$1.3 X 10^{-8}$[n]
MTCA, Method B (ug/L)	N/A+	0.3[p]	N/A+	49[p]	N/A+	9×10^{-8}[p]

N/A - No criterion or standard available.

* MCLs and WQC/WQS were cited as ARARs in the ROD but no numerical values were provided for these. The values shown in the table are those in effect in 1993.
+ WQC/WQS were cited as ARARs in the ROD but no numerical values were provided for these. It is not clear if WQC/WQS for human health were to be included as ARARs.

(a) The MCL is for "Benzo(a)pyrene(PAHs)".

(b) The MCL is for "Dioxin (2,3,7,8-TCDD)".

(c) This value is listed in the ROD for "cPAH". The decision as to how to calculate cPAH was site specific under MTCA in 1993. The value in parenthesis is the Practical Quantitation Limits (PQLs) for cPAHs. These were used for the RAOs as the PQLs were above the MTCA B cleanup levels for groundwater.

(d) This is the value for B(a)P TEQ calculated using MTCA B drinking water equations, toxicity values, and exposure assumptions at a cancer risk of $1 X 10^{-5}$. B(a)P TEQ are based upon the toxicity equivalency factors described in: "Cal EPA. 2005 Air Toxics Hotspots Program Risk Assessment Guidelines, Part II Technical

Support Document for Describing Available Cancer Potency Factors", Cal EPA.

(e) This is the value for PCP calculated using MTCA B drinking water equations, toxicity values, and exposure assumptions at a cancer risk of 1 X 10^{-5}.

(f)) This value is listed in the ROD for "TCDD". The decision as to how to calculate dioxin/furan concentrations was site specific under MTCA in 1993. The value in parenthesis is the Practical Quantitation Limits (PQLs) for TCDD as the PQLs were above the MTCA B cleanup levels for groundwater.

(g) This is the value for 2,3,7,8-TCDD TEQ calculated using MTCA B drinking water equations, toxicity values, and exposure assumptions at a cancer risk of 1 X 10^{-5}. 2,3,7,8-TCDD TEQ are based upon the toxicity equivalency factors described in: Vanden Berg et al 2006. The WHO Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds Toxicological Sciences 2006 93(2);223-241.

(h) This value is listed in the ROD for "cPAH". The decision as to how to calculate cPAH was site specific under MTCA in 1993.

(i) This is the value for B(a)P TEQ calculated using MTCA B toxicity values and exposure assumptions at a cancer risk of 1 X 10^{-6} for direct contact, residential areas. B(a)P TEQ are based upon the toxicity equivalency factors described in: "Cal EPA. 2005 Air Toxics Hotspots Program Risk Assessment Guidelines, Part II Technical Support Document for Describing Available Cancer Potency Factors", Cal EPA.

(j) This value is listed in the ROD for "TCDD". The decision as to how to calculate dioxin/furan concentrations was site specific under MTCA in 1993. As explained in the text, it is assumed that this value is incorrect in the ROD and is more likely to be 6.6 X 10^{-6} mg/kg.

(k)) This is the value for 2,3,7,8-TCDD TEQ calculated using MTCA B toxicity values and exposure assumptions at a cancer risk of 1 X 10^{-6} for direct contact, residential areas. 2,3,7,8-TCDD TEQ are based upon the toxicity equivalency factors described in: Vanden Berg et al 2006. The WHO Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds Toxicological Sciences 2006 93(2);223-241.

(l) Water quality criteria for aquatic life for pentachlorophenol are based on a pH of 6.5. Water quality criteria shown are freshwater acute and freshwater chronic, respectively

(m) The value of 0.0038 ug/L is for each listed carcinogenic PAH and is based on the carcinogenic potency for B(a)P: Benzo(a)Pyrene, Benzo(a)Anthracene, Benzo(b)Fluoranthene, Benzo(k)Fluoranthene, Chrysene, Dibenzo(a,h)Anthracene, Ideno(1,2,3-cd)Pyrene

(n) The value of 5.0E-9 ug/l is for "2,3,7,8-TCDD (Dioxin)"

(o) Federal WQC in the table are based on an excess cancer risk of 10^{-6}.

(p) Based on a cancer risk of 1 X 10^{-5} using MTCA B surface water equations for fish consumption, toxicity values, and exposure assumptions. Values for CPAHs are based upon B(a)P TEQ and for dioxins/furans upon 2,3,7,8-TCDD TEQ using the TEF values form the sources cited in footnotes (d) and (g) , respectively.

The MTCA Method B soil cleanup values used in the ROD for the residential area are compared to the current MTCA Method B values in Table 2. The cleanup value for pentachlorophenol has not changed. The value for B(a)P TEQ has decreased slightly from 0.172 to 0.14 mg/kg. The MTCA Method B soil value shown in the ROD for 2,3,7,8-TCDD TEQ (0.0066 ng/kg or 6.6 X 10^{-9} mg/kg) appears to be an error as the MTCA Method B value in the FS (published less than a year before the ROD) is 5.4 X 10^{-6} mg/kg. It is assumed that the units in the ROD are off by 3 orders of magnitude, therefore, the MTCA B cleanup value that should have been in the ROD is likely 6.6 X 10^{-6} mg/kg. The current MTCA B value is slightly higher at 1.1 X 10^{-5} mg/kg which can be explained largely by one of the methodological changes in MTCA since the ROD was signed (i.e., the use of 0.6 as the gastrointestinal absorption fraction for dioxins in soil in the current regulations compared to 1.0 in the older regulations). Therefore, although numerical changes have occurred in the MTCA Method B soil cleanup values for 2 (dioxins and cPAH) of the 3 major risk drivers since the ROD was signed in 1993, these changes are either not significant (change in B(a)P equivalents from 0.172 to 0.14 mg/kg) or result in a higher clean-up value (change in 2,3,7,8-TCDD TEQ from 6.6 X 10^{-6} to 1.1 X 10^{-5} mg/kg). The MTCA cleanup values in Table 2 are based upon a 1 X 10^{-6} cancer risk level for individual chemicals and for mixtures of dioxins/furans (2,3,7,8-TCDD TEQ) and cPAHs (B(a)P TEQ). The total risk from all chemicals under MTCA must be below a cancer risk of 1 X 10^{-5}. Because EPA remediated all residential areas that were above a total cancer risk of 1 X 10^{-6} for all chemicals, this remediation is in compliance with the current MTCA Method B soil cleanup levels. In addition, the risk levels used to define remediation done in individual properties in the residential areas near the ACC Site were within or below EPA's acceptable cancer risk range for Superfund of 1 X 10^{-6} to 1 X 10^{-4}.

Ecological

The soil cleanup levels in the ROD were based on protection of human health with the assumption that these would also be protective of ecological receptors.

(2) Groundwater

For groundwater, protection of human health and the environment was to be achieved through removal of the floating product underneath the facility treatment works. In the ROD, the cleanup levels listed were the MTCA B drinking water values. The federal Safe Drinking Water Act (SDWA) and state MCLs were listed as ARARs, however, numerical values for these MCLs were not provided. These MCLs and MTCA B values were to be met at the facility boundary. In Table 2, the values for the MCLs in effect in 1993 are included under ROD criteria and compared to the current MCLs. The MCLs in effect in 1993 for all of the chemicals are the same as those now in effect. MTCA has a preference for the use of the more stringent of the federal or state MCLs, however, these MCLs must be protective under MTCA (i.e., at or below a cancer risk level of 1 X 10^{-5} and a Hazard Quotient of 1). As shown in Table 2, when the MTCA B drinking water values are calculated at a 10^{-5} cancer risk, the values are ten fold higher than those used in the ROD (note that the ROD used Practical Quantitation Limits (PQLs) for TCDD and cPAHs for the cleanup values in place of the MTCA B values because the PQLs in 1993 were above the MTCA B cleanup levels for groundwater). This is presumably due to the current stipulation in MTCA that the MCLs be compared to a cancer risk level of 1 X 10^{-5}. The MCLs for pentachlorophenol are more protective than the MTCA values, therefore the MCLs would be the appropriate ARARs to use for pentachlorophenol. However, for B(a)P and 2,3,7,8-TCDD, the MTCA B values (cancer risk of 1 X 10^{-5}) are lower than the MCLs, therefore the MTCA B values would be the appropriate ARARs to compare to future groundwater monitoring results. To be consistent with the new MTCA regulations, water sampling concentrations for B(a)P (cPAHs) and dioxins should be calculated as B(a)P TEQ and 2,3,7,8-TCDD TEQ.

(3) Surface Water

For surface water in the ROD, freshwater ambient water quality criteria (AWQC) and MTCA B cleanup standards for surface water were to be met in Dillenbaugh Creek. As shown in Table 2, aquatic life AWQC are available for pentachlorophenol only. The federal aquatic AWQC for pentachlorophenol have decreased since the ROD was signed. No recent water data are available for Dillenbaugh Creek for comparison to the AWQC. The two water samples available from ponded water on the Site are below the current pentachlorophenol aquatic WQC.

Human consumption of biota was not included in the HHRA, therefore, this pathway did not have a RAO or a MTCA B fish consumption cleanup value in the ROD. It is not clear if the designation of WQC/WQS in the ROD included those WQC/WQS for the protection of human health. As previously discussed, based upon the dioxin/furan levels in a composite of Cutthroat Trout fillet from the 1998 Ecology sampling, Dillenbaugh Creek is listed as impaired under the CWA §303(d) program. Based both upon the elevated sediment and biota dioxin levels in Dillenbaugh Creek near the ACC facility, EPA has decided that the biota consumption pathway should be included as a potential route of exposure for humans at the Site. Therefore, water quality criteria and standards and MTCA B values for human consumption of biota should be considered for screening surface water data for Site protectiveness, when such data are collected in the future. Table 2 includes the appropriate values. The WQS/WQC take precedence over the MTCA B values if it can be shown that these standards and criteria are protective under MTCA (i.e., protective at or below a cancer risk of 1×10^{-5} and at or below a Hazard Quotient of 1). As the WQS/WQC are lower than the MTCA B values, they would be used as the ARARs.

Although the use designation for Dillenbaugh Creek includes Domestic Water Supply Use, no one is using the water now for this purpose, nor are there any plans to do so in the future. However, potential ARARs for the Creek should include those for drinking water as well as those for fish consumption based upon the designated uses of Dillenbaugh Creek.

(4) Sediment

As discussed previously, the potential human and ecological impacts from consumption of biota that may have bioaccumulated contaminants from sediments in Dillenbaugh Creek were not evaluated in the risk assessment for the Site and no RAOs or cleanup numbers were included in the ROD for this pathway. Neither EPA nor the state of Washington have criteria, standards, or risk based values to evaluate this pathway for freshwater. In addition, since the ROD, EPA has developed procedures for deriving protective benchmarks and for evaluating ecological risks to invertebrates. These methods rely upon predictions based on summation of benzo[a]pyrene TEFs in sediment interstitial water. These procedures use a larger suite of PAH compounds (up to 34) than the 13 usually considered (USEPA 2007).

Other ARARs that have changed are action-specific such as the Resource Conservation and Recovery Act (RCRA) and Washington Dangerous Waste regulations that currently are not applicable as no remedial action is currently occurring requiring the treatment, storage, and/or disposal of hazardous waste. However these are still relevant and appropriate. An ARAR analysis is provided in Attachment 10.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Information showing that elevated levels of dioxin contamination was present in Dillenbaugh Creek sediments in 1998 and 2004 suggests that historic Site-related or unknown (non-Site related) sources of these compounds may still exist. To be protective, EPA recommends that while the constructed remedy appears to be functioning as intended, sampling be conducted to determine if dioxin/furans are present in Dillenbaugh Creek and if so, whether they are site related. If dioxins/ furans are present above screening levels and background, the potential risks from the bioaccumulation of dioxins in Dillenbaugh Creek sediment into biota that may be consumed by ecological receptors or humans should also be re-examined.

Technical Assessment Summary

The remedy is functioning as intended although maintenance inspections have not been conducted by Ecology since 2001. Historical groundwater samples collected downgradient indicate that contaminants have not migrated off-Site. Low levels of PAHs were detected in ponded on-Site surface water samples; however, no environmental standards were exceeded. No background samples or samples from other potential sources were collected. The 1992 Risk Assessment method of evaluating impacts to ecological receptors resulted in uncertainties regarding the severity of potential impacts. Residual dioxin contamination was detected in sediments at Dillenbaugh Creek in 1998 and 2004 downstream of the stormwater lagoon. These sediments were screened against health protective screening values for bioaccumulative chemicals developed by ODEQ. There is uncertainty related to the source of this contamination, when it was deposited, if Dillenbaugh Creek sediments are currently contaminated, and if so, how it may be impacting human health and ecological receptors. The 1992 Risk Assessment did not evaluate vapor intrusion in the event of Site development. The most contaminated areas were excavated to a depth of 10 feet and a soil cap with a geomembrane was placed above these areas. Six to eight feet of additional fill was placed on top of the cap prior to construction of the buildings.

VIII. Issues

Table 4. Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1. Maintenance inspections have not been conducted since 2001.	N	Y
2. Dillenbaugh Creek sediment samples collected in 1998 and 2004 exhibited dioxin contamination.	N	Y*

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
3. The 1992 human health Risk Assessment did not evaluate the potential human health exposure from consumption of biota that may bioaccumulate contaminants from water and/or sediments in Dillenbaugh Creek.	N	Y*
4. The 1992 ecological Risk Assessment method of evaluating impacts to ecological receptors resulted in uncertainties regarding the severity of potential impacts.	N	Y*
5. The 1992 Risk Assessment did not evaluate vapor intrusion.	N	N

*Note that a "Yes" or "No" answer is required for this Table. For the ACC Site, these "Y" answers indicate where we need more data to determine the potential for the issue to affect protectiveness, not that we know there is a problem with remedy protectiveness.

The following issues noted in this review do not necessarily affect protectiveness but need to be addressed in the Operations and Maintenance Plan and future O&M as discussed in the next section:

- Groundwater monitoring well MW-25 is damaged and cannot be sampled.
- Groundwater monitoring has not taken place since 2001.
- The current Site conditions have changed considerably since the remedial action. Additional fill, buildings and pavement currently cover most of the northern portion of the Site.
- Low-level PAHs have been present in ponded surface water adjacent to landfill.

IX. Recommendations and Follow-Up Actions

Table 5. Recommendations and Follow-up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
1. Maintenance inspections have not been conducted since 2001.	Regular maintenance inspections should be conducted to ensure Site conditions and ICs remain protective.	Ecology	EPA	July 2010	N	Y
2. Dillenbaugh Creek sediment samples collected in 1998 and 2004 exhibited dioxin	Develop and implement a sampling plan to determine if Creek sediments remain contaminated	EPA	EPA/ Ecology	September 2010	N	Y*

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
contamination.	with dioxin/furans and if so, whether ACC is the source.					
3. The 1992 human health Risk Assessment did not evaluate the potential human health exposure from consumption of biota that may bioaccumulate contaminants from water and/or sediments in Dillenbaugh Creek.	If Dillenbaugh Creek sediments exhibit ACC-related dioxins/furans above screening levels and background, evaluate the potential risks from bioaccumulation of dioxins into biota that are consumed by humans.	EPA	EPA/ Ecology	March 2011	N	Y*
4. The 1992 ecological Risk Assessment method of evaluating impacts to ecological receptors resulted in uncertainties regarding the severity of potential impacts.	Review uncertainties associated with the 1992 Risk Assessment evaluation of impacts to ecological receptors. Apply updated methods as appropriate to evaluate potential impacts from the ACC Site on aquatic and terrestrial species. Utilize any new data collected as a result of this Five-Year Review.	EPA	EPA/ Ecology	March 2011	N	Y*
5. The 1992 Risk Assessment did not evaluate vapor intrusion.	Complete vapor intrusion modeling to evaluate the potential pathway.	EPA	EPA/ Ecology	March 2010	N	N

*Note that a "Yes" or "No" answer is required for this Table. For the ACC Site, these "Y" answers indicate where we need more data to determine the potential for the issue to affect protectiveness, not that we know there is a problem with remedy protectiveness.

Following are the follow up recommendations for the issues noted in this review that do not necessarily affect protectiveness but need to be addressed in the Operations and Maintenance Plan and future O&M:

- MW-25 should be decommissioned according to Washington State regulations.
- MW-26 should be sampled within the next year. Need for subsequent ground water

sampling should be addressed in the updated O&M Plan.

- The O&M plan should be updated to reflect that buildings and pavement cover most of the northern portion of the Site.
- The O&M plan should be updated to recommend that if ponded surface water samples are collected in the future, off-Site ponded samples adjacent to the railroad ditch and background samples also be collected for comparison.

X. Protectiveness Statement

A protectiveness determination of the remedy at the ACC Site cannot be made at this time until the following work is completed: (1) collection of additional sediment samples from Dillenbaugh Creek to determine if sediments continue to exhibit dioxin/furan contamination; (2) if Dillenbaugh Creek sediments exhibit ACC-related dioxins/furans above screening levels and background, follow up with an evaluation of potential human health risks from exposure to contaminants in Dillenbaugh Creek sediments through consumption of biota that may bioaccumulate contaminants from the Creek; (3) vapor intrusion modeling. It is expected that this evaluation will take approximately 18 months to complete, at which time a protectiveness determination will be made.

XI. Next Review

The next five-year review for the ACC Site is required by September 2014, five years from the date of this review.

ATTACHMENTS

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ATTACHMENT 1

FIGURES

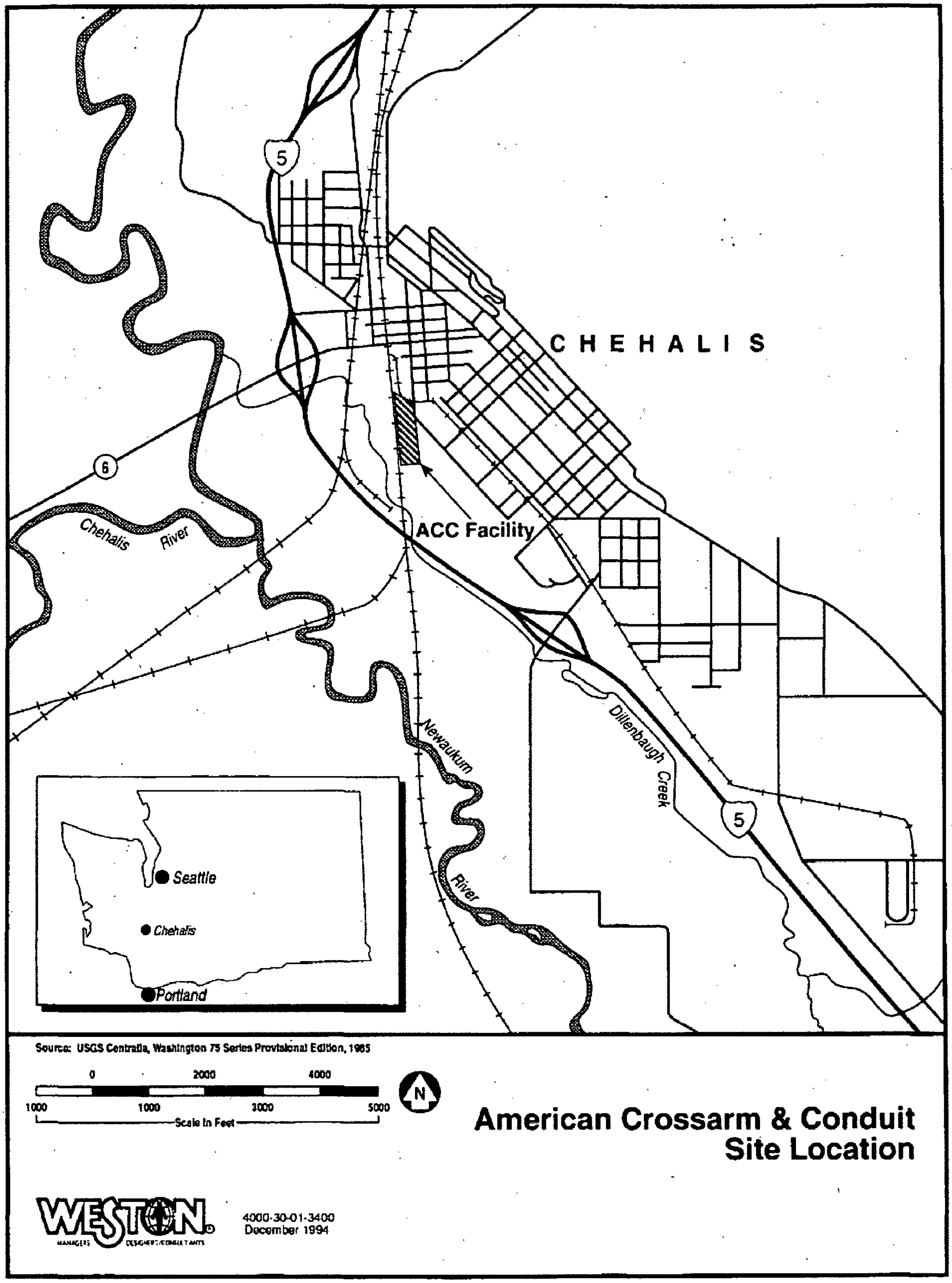


Figure 1. American Crossarm Site Location

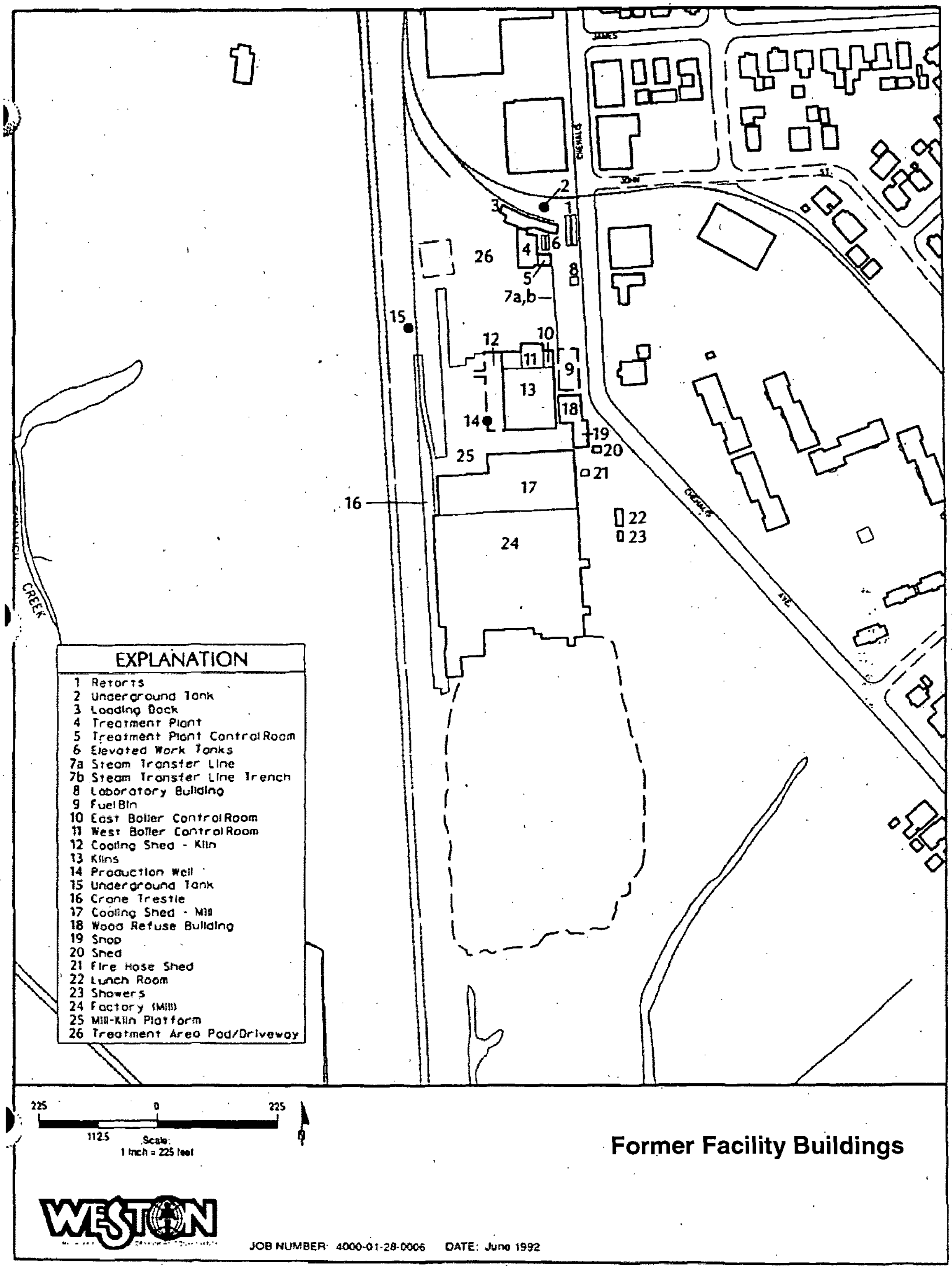


Figure 2. Former Facility Buildings

Figure 3. Current American Crossarm Site Map

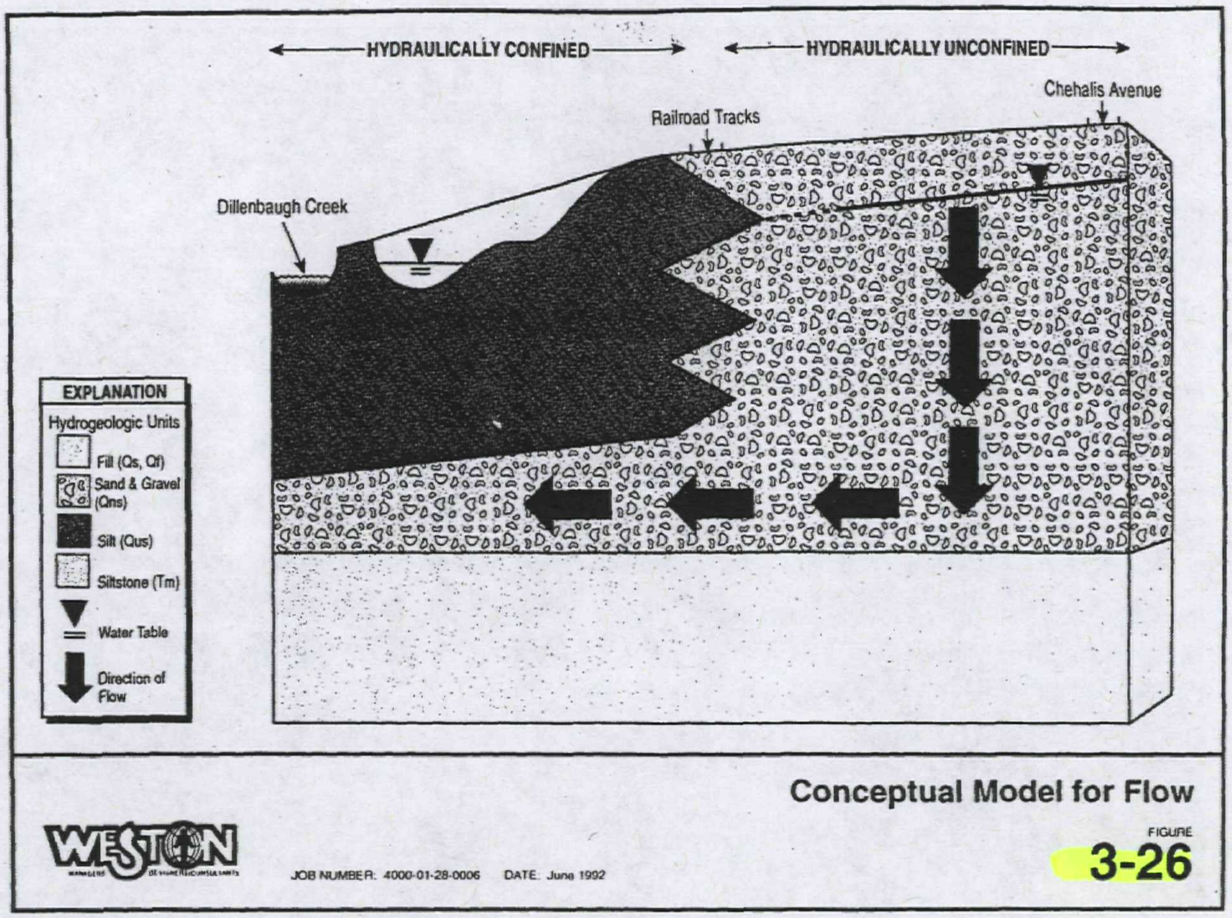


Figure 4. Conceptual Hydrogeologic Model

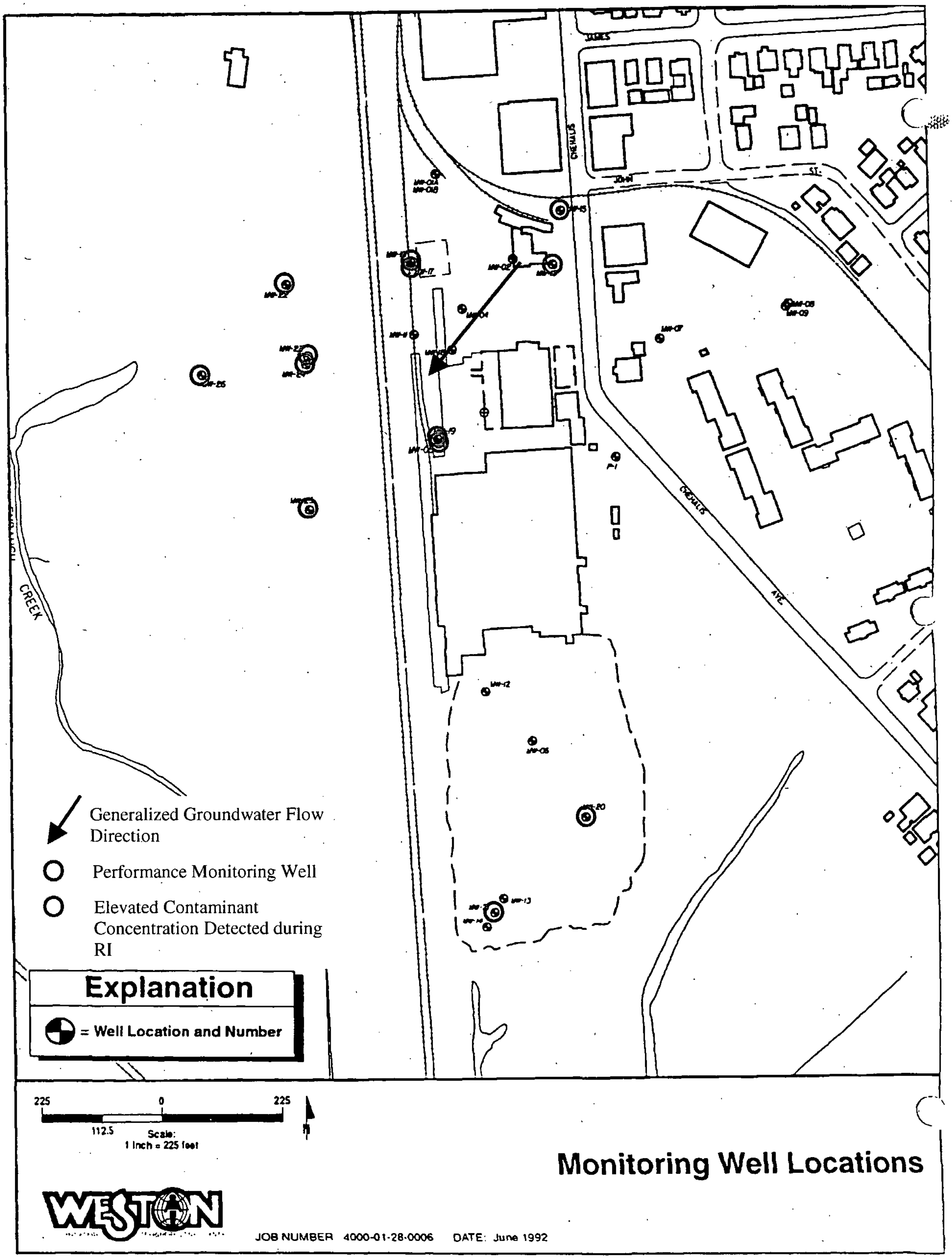
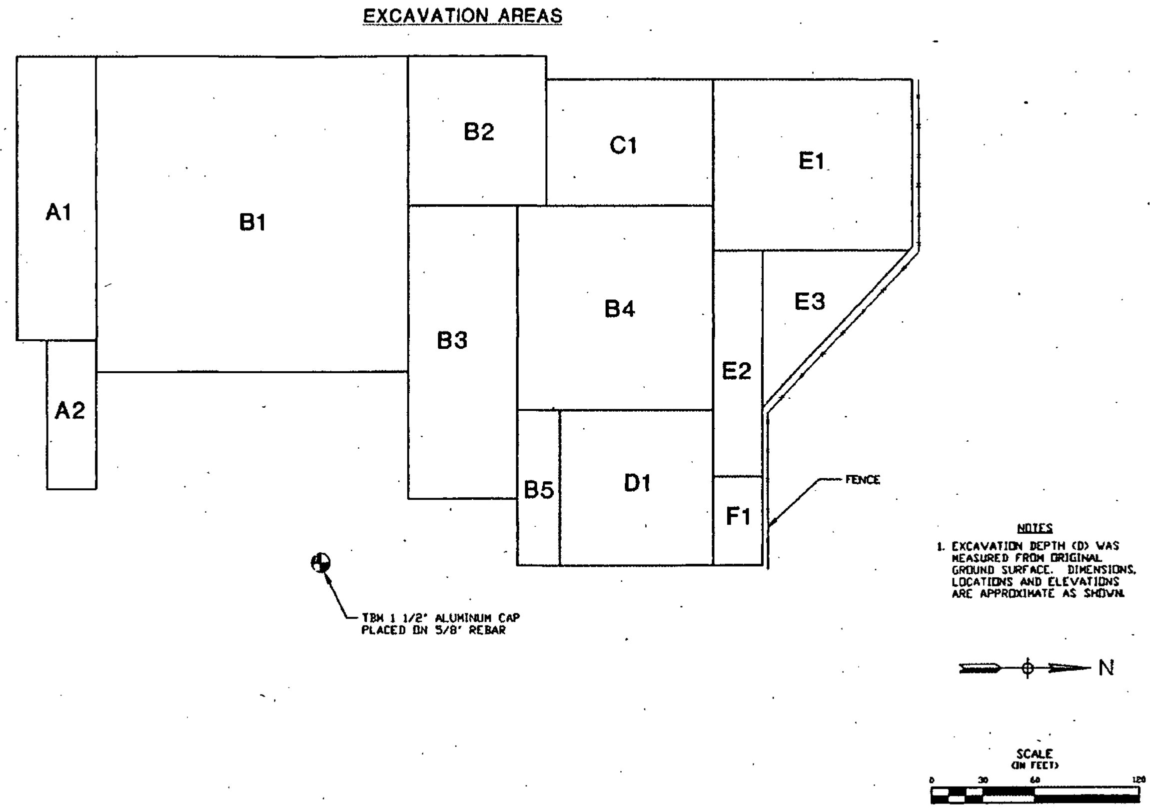


Figure 5. Monitoring Well Location Map Showing Elevated Contaminant Concentrations during the RI

EXCAVATION DIMENSIONS BY AREA

AREA	LENGTH (NORTH-SOUTH)	LENGTH (EAST-WEST)	DEPTH
A1	48	171	6
A2	29	89	6
B1	190	180	6
B2	84	90	2
B3	66	176	3.5
B4	118	121	2
B5	26	95	2
C1	100	76	10
D1	92	95	10
E1	120	102	5
E2	30	137	5
E3	90	95	5
F1	30	53	7



AMERICAN CROSSARM & CONDUIT SUPERFUND SITE

WESTON

EXCAVATION DEPTHS

DWG. C-010

RAY THOMAS | JULY 3, 1996

SEE SCALE | 4000-030-001-7000

LDV | SRF | 7/11/96

Figure 6. Final Site Excavation Depths

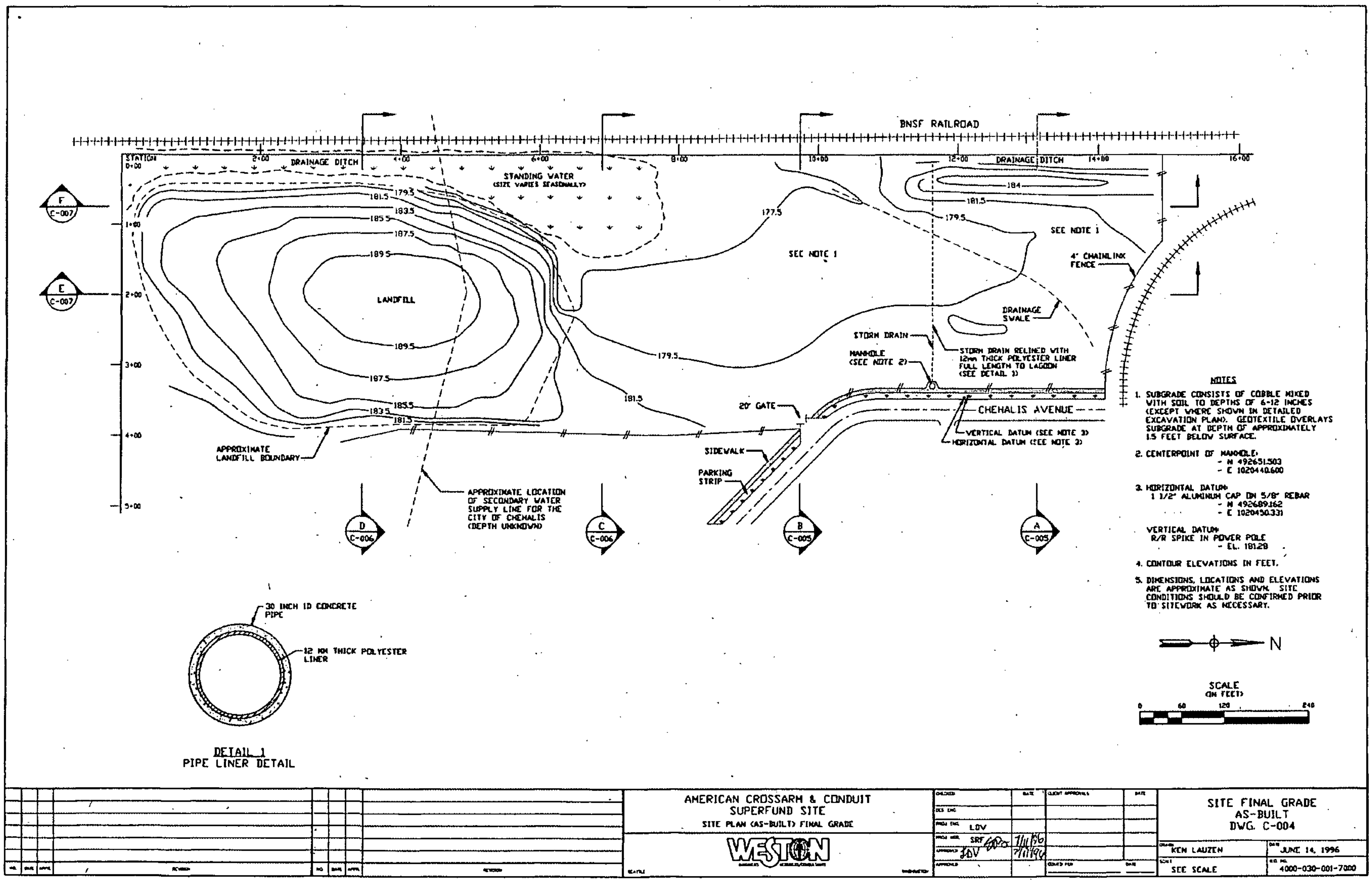


Figure 7. Final Site As-Built

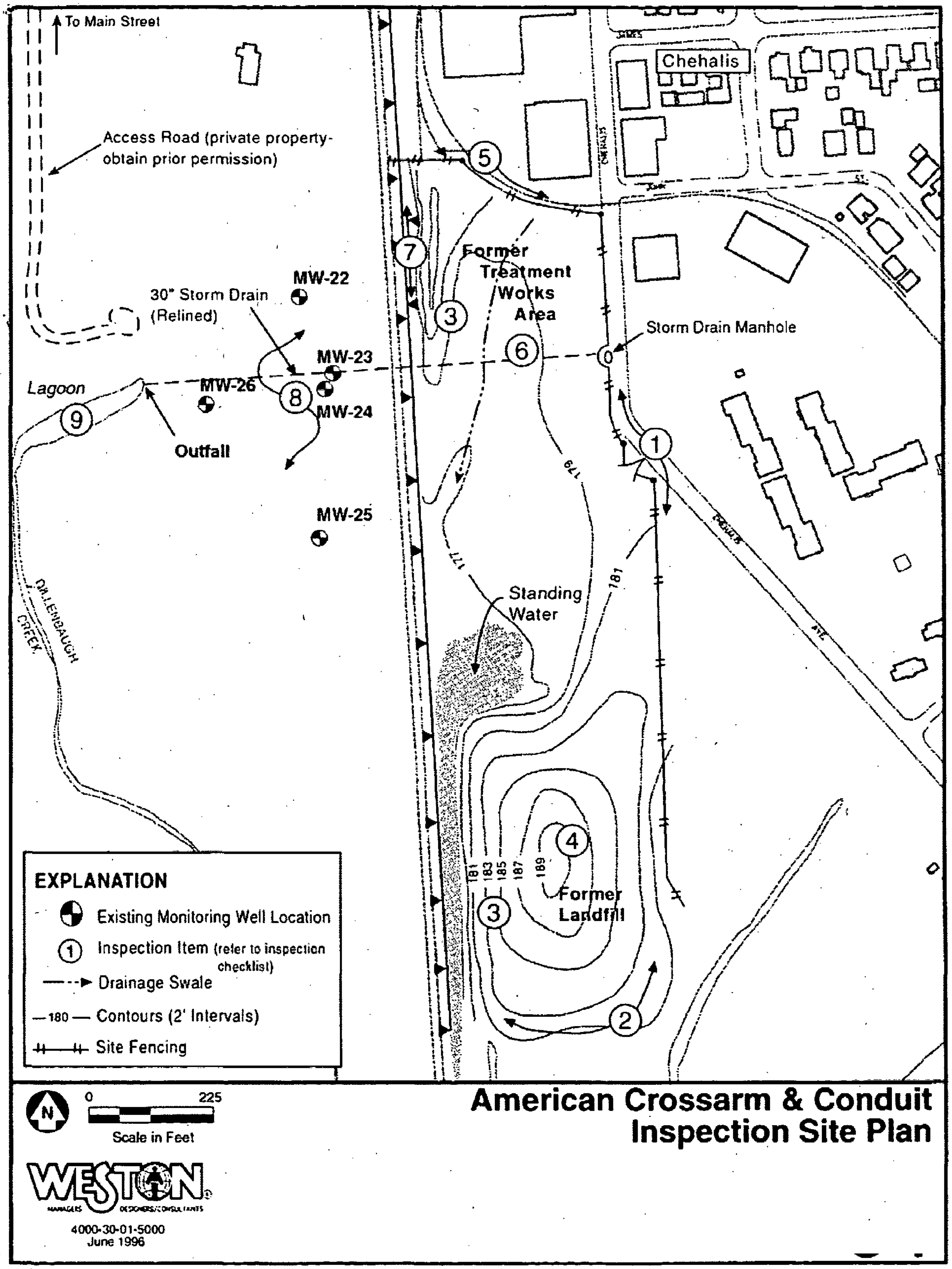


Figure 8. O&M Inspection Site Plan

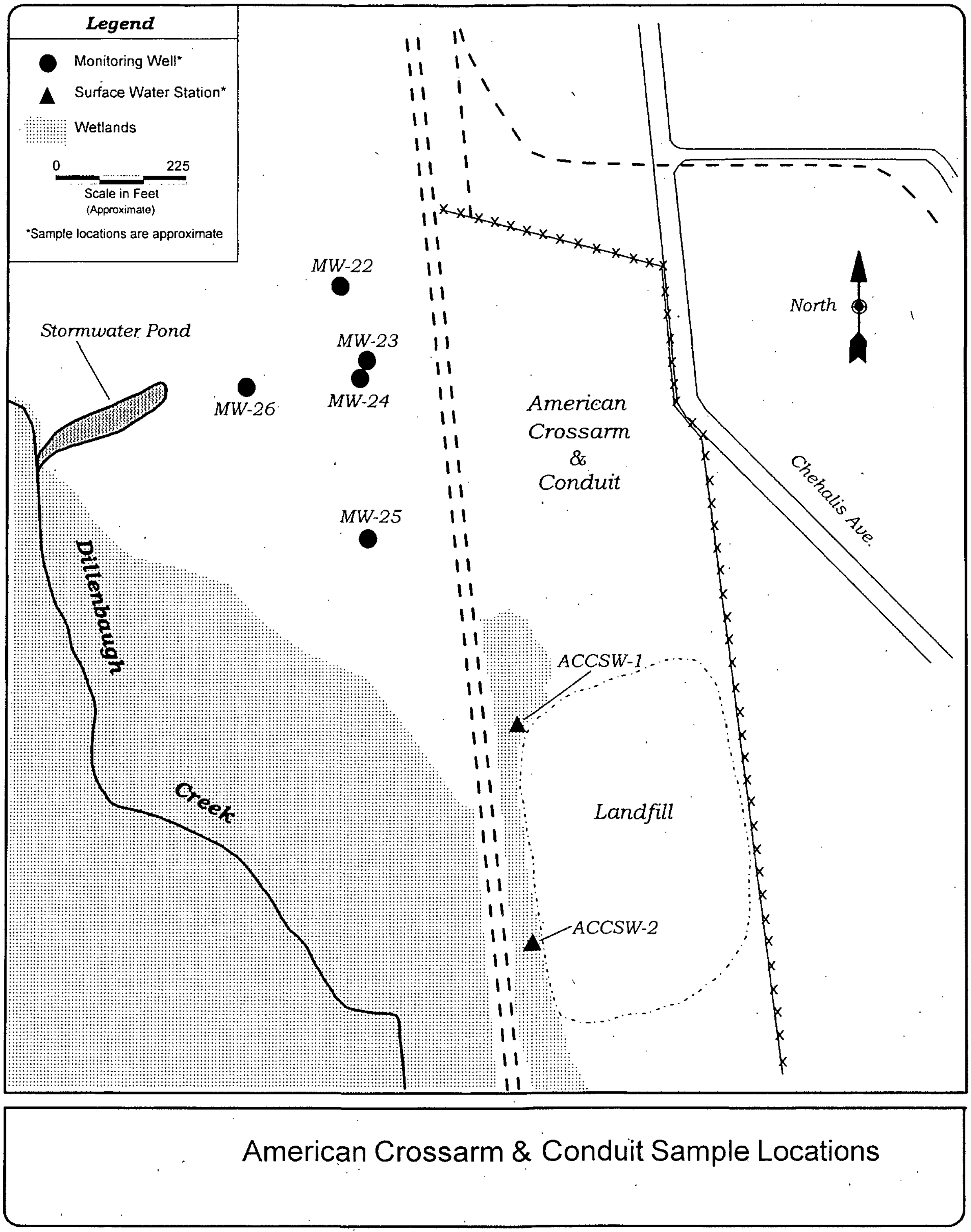


Figure 9. Performance Monitoring Well and Surface Water Locations

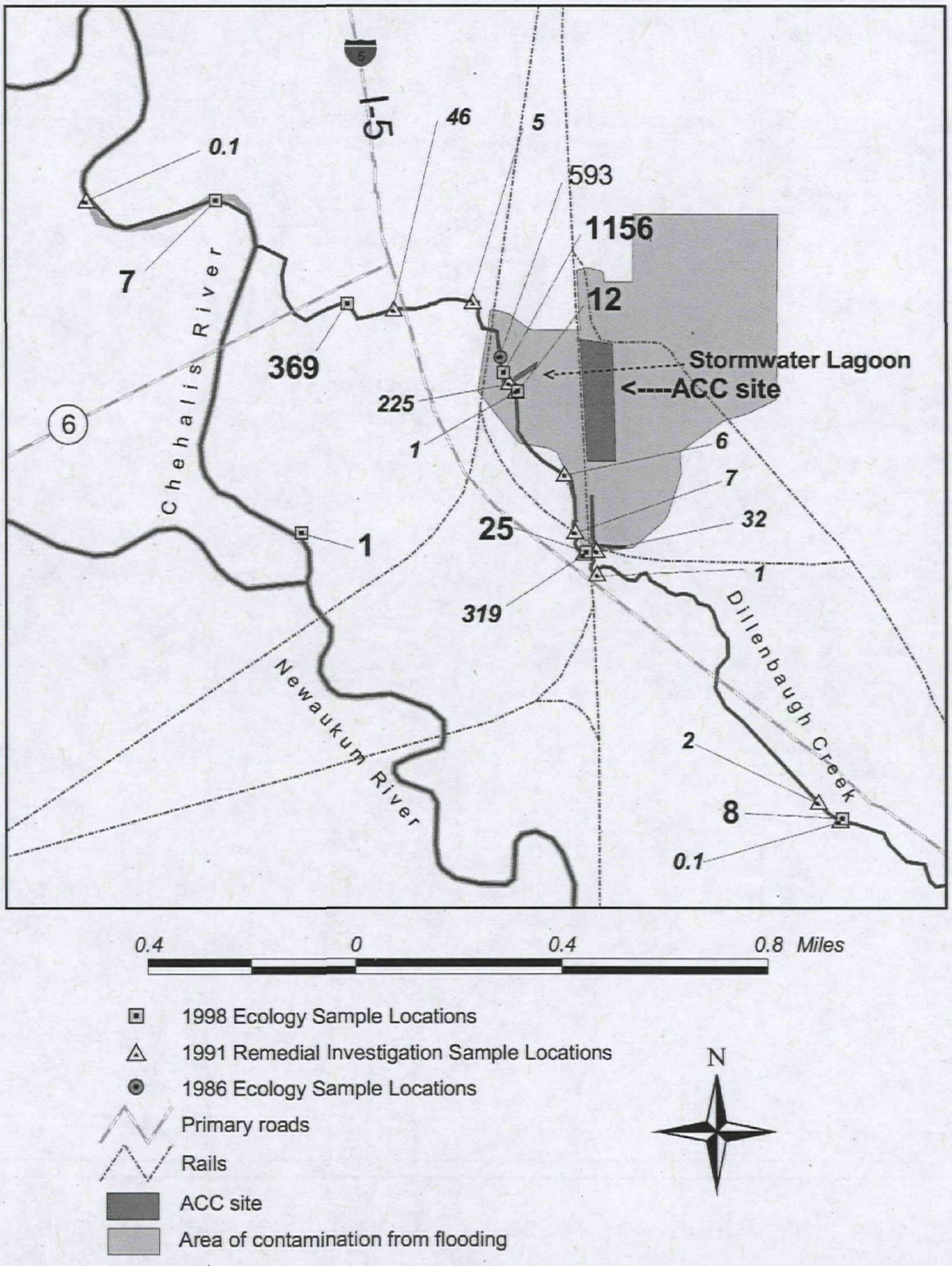


Figure 6. PCDD/PCDF Concentrations (TEQ pptr dry weight) in Sediment Samples from the 1986, 1991, and 1998 Studies

Figure 10. Dioxin/Furan Concentrations in Sediment Samples Collected in 1986, 1991, and 1998

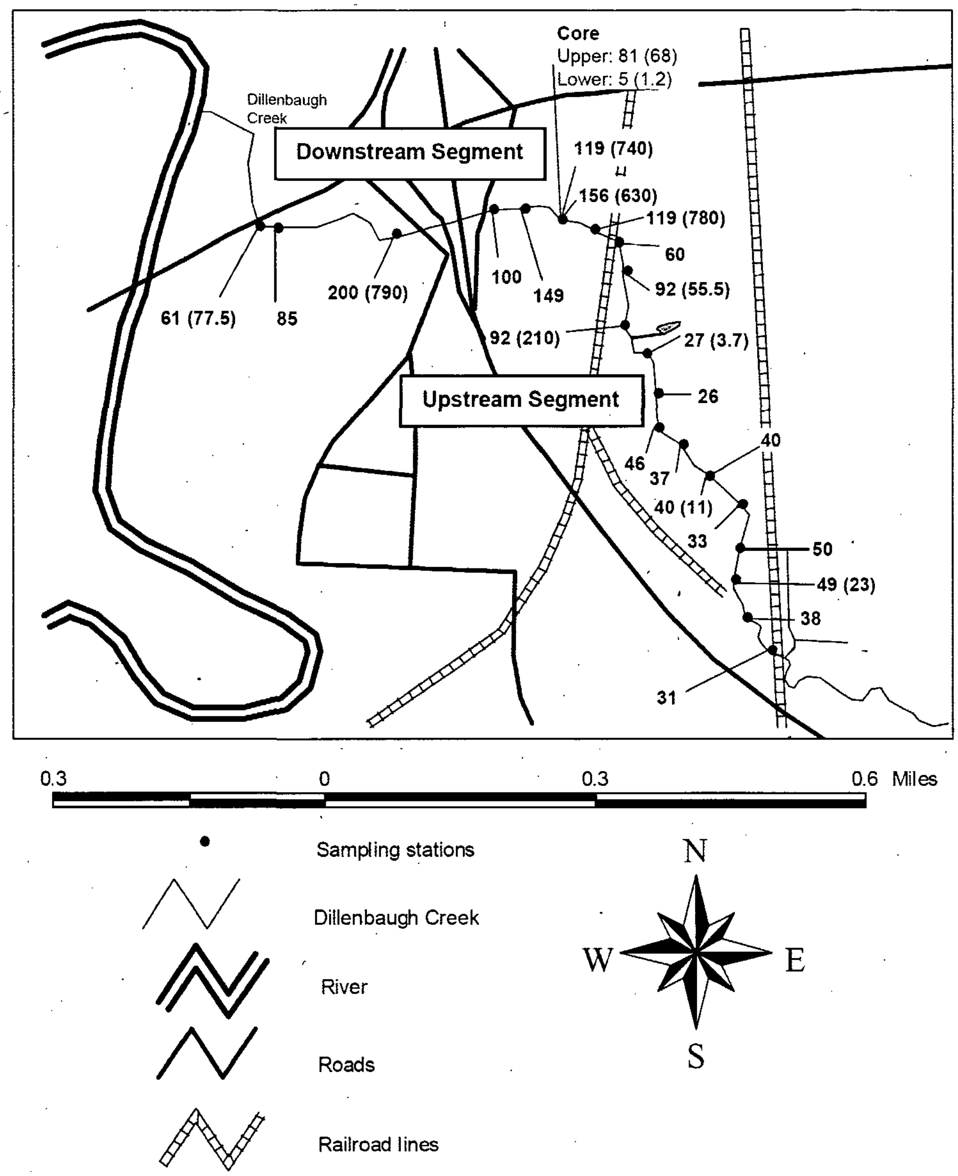


Figure 5. PCDD/PCDF TEQs (pg/g) in Dillenbaugh Creek Sediments from EIA Analysis. Values in Parentheses Show Results from HRGC/HRMS Analysis.

Figure 11. Dioxin/Furan Concentrations in Sediment Samples Collected in 2004

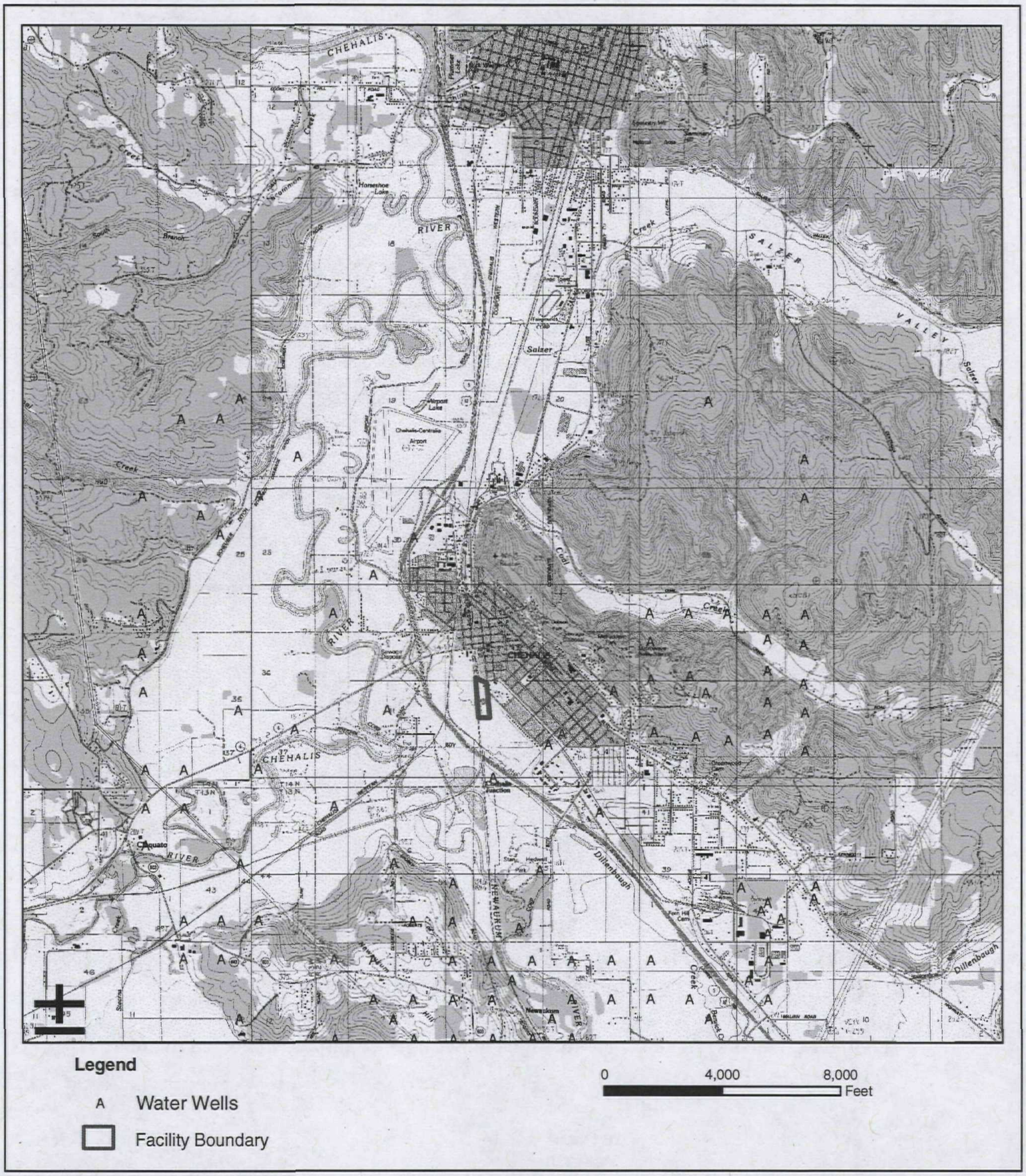
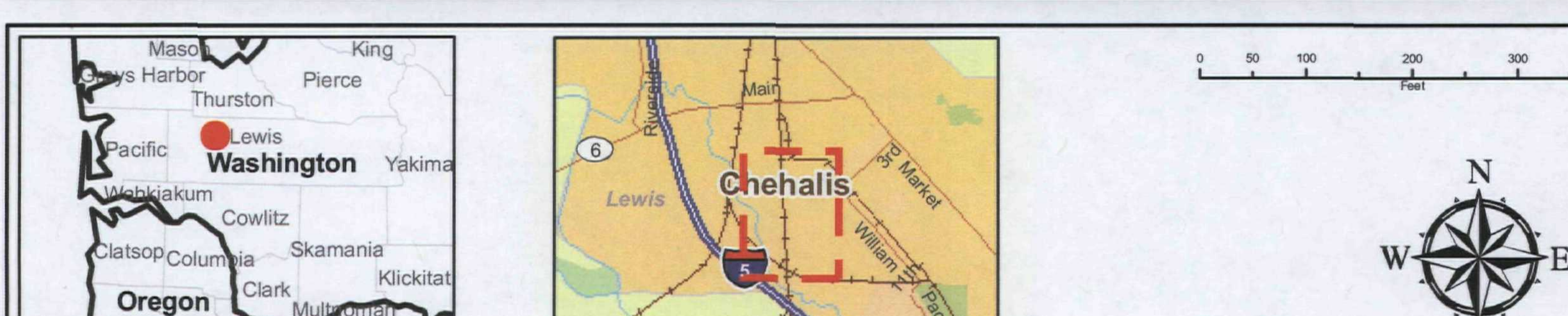


Figure 12. Domestic, Irrigation, and Industrial Water Wells within 2 Miles of the American Crossarm Facility

Figure 13, Current American Crossarm Site Cap and Encumbrance Locations and Parcel Boundaries.



DISCLAIMER - While the United States Army Corps of Engineers, (hereinafter referred to USACE) has made a reasonable effort to insure the accuracy of the maps and associated data, its should be explicitly noted that USACE makes no warranty, representation or guaranty, either express or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. The USACE, its officers, agents, employees, or servants shall assume no liability of any nature for any errors, omissions, or inaccuracies in the information provided regardless of how caused. The USACE, its officers, agents, employees or servants shall assume no liability for any decisions made or actions taken or not taken by the user of the maps and associated data in reliance upon any information or data furnished here. By using these maps and associated data the user does so entirely at their own risk and explicitly acknowledges that he/she is aware of and agrees to be bound by this disclaimer and agrees not to present any claim or demand of any nature against the USACE, its officers, agents, employees or servants in any forum whatsoever for any damages of any nature whatsoever that may result from or may be caused in any way by the use of the maps and associated data.

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Eastern edge of landfill

Northern edge of landfill

Water main sign for secondary water line

Chehalis Ave facing north

Elevation difference between Chehalis Ave and development

Mystery capped pipe from north development

Depression north of stormwater basin facing south

Stormwater basin facing south

Landfill facing north

Landfill facing south

Wetland south of landfill

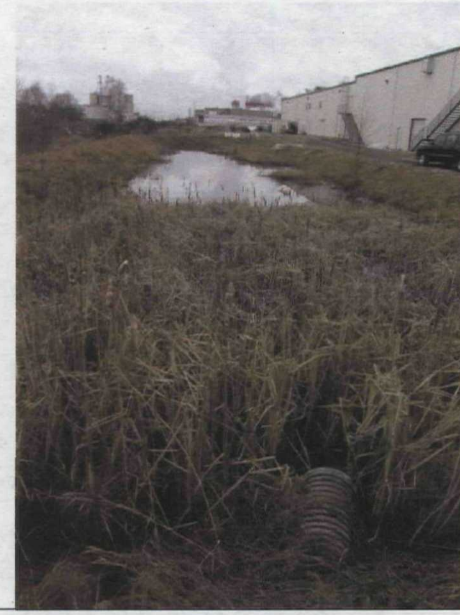
Concrete slab remaining south of landfill

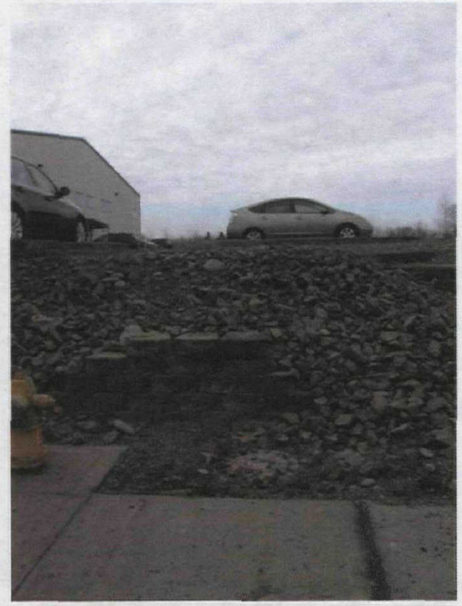
Sheen observed in surface water between landfill and rail line

Western edge of landfill facing north

Earthen piles on western edge of landfill

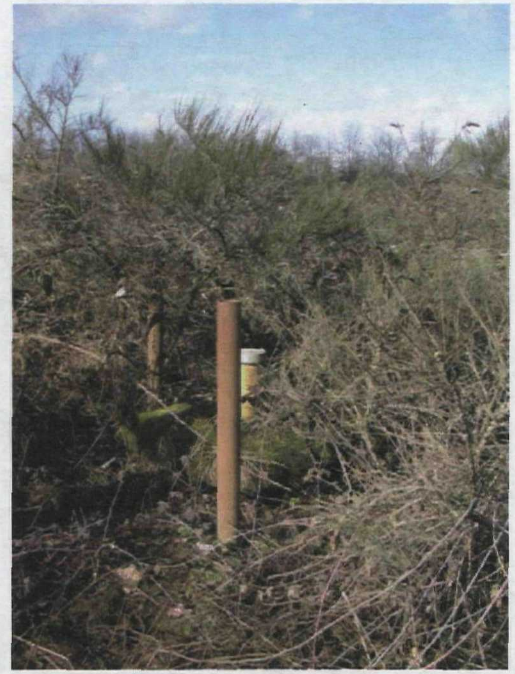
Cattail piles on western edge of landfill

	
Wider surface water area along the northwestern side of the landfill	Stormwater basin facing north

	
Overflow pipe from stormwater basin to surface water	Manhole to stormwater pipe leading to stormwater lagoon.
	

Stormwater lagoon	Concrete pipe outflow in lagoon
	
Confluence of lagoon and Dillenbaugh Creek.	Stormwater lagoon facing east
	
Clearing at end of road southwest of lagoon	Facing east toward former facility

Monitoring Well MW-25



Monitoring Well MW-26

ATTACHMENT 2

SITE PHOTOS

ATTACHMENT 3

LIST OF REVIEWED DOCUMENTS

Attachment 3. List of Reviewed Documents

Lewis County Title Co., 2009. Commitment for Title Insurance. March 2009.

National Research Council. 2006. Health Risks from Dioxin and Related Compounds. Evaluation of the EPA Reassessment. National Academies Press. http://www.epa.gov/ncea/pdfs/dioxin/nas-review

Roy F. Weston, Inc., 1992. American Crossarm & Conduit, Remedial Investigation Report. Prepared for EPA Region X. September 1992.

Roy.F. Weston, Inc., 1996. Maintenance and Monitoring Plan, American Crossarm and Conduit, Chehalis, Washington. Prepared for EPA Region X. June 1996.

Roy.F. Weston, Inc., 1996. Remedial Action Report, American Crossarm and Conduit, Chehalis, Washington. Prepared for EPA Region X. June 1996.

Stevens, Jeffery, 2005. A methodology for deriving tissue residue benchmarks for aquatic biota: a case study for the fish exposed to 2,3,7,8-Tetrachlorodibenzo-p-Dioxin. Integrated Environmental Assessment and Management. 1(2): 142-151.

U.S. Environmental Protection Agency, 1993. American Crossarm & Conduit, Record of Decision. May 1993.

U.S. Environmental Protection Agency, 1996. Superfund Site Closeout Report, American Crossarm & Conduit, Chehalis, Washington. September 1996.

U.S. Environmental Protection Agency. 2003 . Exposure and Human Health Reassessment of 2,3,7,8-Tetraachlorodbenzo-p-Dioxin (TCDD) and Related Compounds, NAS Review Draft. EPA/600/P-00/001Cb .

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U.S. Environmental Protection Agency, 2007. Evaluating Ecological Risk to Invertebrate Receptors from PAHs in Sediments at Hazardous Waste Sites. (External Review Draft). EPA/600/R-06, ERASC-011. (January)

U.S. Environmental Protection Agency, 2007. Evaluating Ecological Risk to Invertebrate Receptors from PAHs in Sediments at Hazardous Waste Sites. (External Review Draft). EPA/600/R-06, ERASC-011. (January)

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Washington State Department of Ecology, 1999. American Crossarm & Conduit Monitoring Results, May 5 and October 14, 1998. October 1999.

Washington State Department of Ecology, 1999. American Crossarm & Conduit Monitoring Results, June 22, 1999. October 1999.

Washington State Department of Ecology, 2000. American Crossarm & Conduit Monitoring Results, September 1999 and June 2000. December 2000.

Washington State Department of Ecology, 2001. American Crossarm & Conduit Monitoring Results, November 2000 and April 2001. June 2001.

Washington State Department of Ecology, 2002. Reconnaissance Survey of Dioxins and Furans in Dillenbaugh Creek and Chehalis River near the American Crossarm Site. September 2002.

Washington State Department of Ecology, 2005. Spatial Extent of Dioxin/Furan Contaminated Sediments in Dillenbaugh Creek. April 2005.

World Health Organization (WHO) 2005. Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. ToxSci Advance Access published online July 7, 2006. http://www.who.int/ipcs/assessment/tef_update/en/

ATTACHMENT 4

GROUNDWATER PERFORMANCE MONITORING DATA

Attachment 4. Groundwater Performance Monitoring Data (µg/L)

Well	Date	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene	Chrysene	Dibenzo-furan	Fluoranthene	Fluorene
MTCA Method B		*2.4*	*32*	*960*	*na*	*4800*	*0.012*	*32*	*640*	*640*
MW-22	1/6/1997	***0.0038 J***	***0.0097 J***	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U	0.0074 U
MW-22	9/9/1997	--	--	--	--	--	--	--	--	--
MW-22	12/10/1997	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U	0.0066 U
MW-22	5/5/1998	***0.0054***	***0.01***	***0.0026 J***	0.0066 U	0.0066 U	0.0066 U	0.0033 U	0.0033 U	0.0028 J
MW-22	10/14/1998	***0.0097***	--	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
MW-22	6/22/1999	--	--	--	--	--	--	--	--	--
MW-23	1/7/1997	***0.015 J***	***0.029***	***0.0014 J***	***0.0051 J***	***0.0032 J***	***0.0027 J***	0.00095 UJ	***0.0068 J***	***0.014***
MW-23	9/9/1997	--	--	--	--	--	--	--	--	--
MW-23	9/10/1997	--	--	--	--	--	--	--	--	--
MW-23	12/10/1997	0.0064 U	0.0064 U	0.0064 U	0.00056 J	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0064 U
MW-23	5/5/1998	***0.0054***	***0.01***	0.0033 J	0.0068 U	0.0068 U	0.0068 U	***0.0026 J***	0.0034 U	***0.0033 J***
MW-24	1/7/1997	***0.0094 J***	***0.007 J***	0.0077 U	0.0077 U	***0.0037 J***	***0.0025 J***	0.0077 U	***0.0055 J***	***0.0097***
MW-24	9/10/1997	--	--	--	--	--	--	--	--	--
MW-24	12/10/1997	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U
MW-24	5/5/1998	--	--	--	--	0.0066 U	--	0.0033 U	--	--
MW-24	10/14/1998	0.0063 U	***0.014***	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U
MW-24	6/22/1999	0.0063 U	0.0063 U	0.0032 U	0.0032 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0032 U
MW-24	9/29/1999	***0.0051 J***	***0.011 J***	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
MW-25	1/6/1997	***0.007 J***	***0.017 J***	0.0078 U	0.0078 U	***0.0023 J***	0.0078 U	0.00041 UJ	***0.0012 J***	***0.0037 J***
MW-25	9/9/1997	--	--	--	--	--	--	--	--	--
MW-25	12/10/1997	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U
MW-25	5/5/1998	***0.0062***	***0.012***	0.0064 U	0.0064 U	0.0064 U	0.0064 U	0.0032 U	0.0032 U	0.0064 U
MW-25	10/14/1998	***0.011***	***0.026***	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U	0.0062 U
MW-25	6/22/1999	0.0063 U	0.0063 U	***0.00014 J***	0.0032 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0032 U
MW-25	9/29/1999	***0.0072 J***	***0.015 J***	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
MW-25	6/8/2000	***0.011***	***0.016***	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U
MW-25	11/17/2000	0.01 U	***0.009***	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-25	4/27/2001	***0.014***	***0.036***	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U
MW-26	11/17/2000	0.01 U	***0.011***	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
MW-26	4/27/2001	***0.02***	***0.051***	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U	0.007 U

Notes: Bold indicates detected concentration.
-- Not analyzed

Attachment 4 Cont. Groundwater Performance Monitoring Data (µg/L)

Well	Date	Naph-thalene	Pentachloro-phenol	Phenan-threne	Pyrene	Retene
MTCA Method B		*160*	*0.73*	*na*	*480*	*na*
MW-22	1/6/1997	0.014 UJ	0.029 U	***0.0035 J***	0.0074 U	0.0074 U
MW-22	9/9/1997	--	0.003 U	--	--	--
MW-22	12/10/1997	0.0071 U	--	0.0066 U	0.013 U	0.0066 U
MW-22	5/5/1998	***0.015***	***0.0033 J***	0.0066 U	0.0066 U	***0.0034 J***
MW-22	10/14/1998	***0.02***	***0.0031 J***	0.0062 U	0.012 U	0.0062 U
MW-22	6/22/1999	--	--	--	--	--
MW-23	1/7/1997	***0.12***	0.031 U	***0.039***	***0.0055 J***	0.0076 U
MW-23	9/9/1997	--	--	--	--	--
MW-23	9/10/1997	--	0.003 U	--	--	--
MW-23	12/10/1997	***0.014***	--	0.0064 U	0.013 U	0.0064 U
MW-23	5/5/1998	***0.015***	0.021 U	0.0068 U	0.0068 U	0.0068 U
MW-24	1/7/1997	***0.069***	0.031 U	***0.022***	***0.028***	0.0077 U
MW-24	9/10/1997	--	0.003 U	--	--	--
MW-24	12/10/1997	0.0067 U	--	0.0067 U	0.013 U	0.0067 U
MW-24	5/5/1998	--	0.02 U	--	0.0066 U	--
MW-24	10/14/1998	***0.014***	0.04 U	0.0063 U	0.012 U	0.0063 U
MW-24	6/22/1999	0.0063 U	0.041 U	0.0063 U	0.0063 U	0.0063 U
MW-24	9/29/1999	0.016 U	0.04 U	0.016 U	0.016 U	0.016 U
MW-25	1/6/1997	***0.032***	0.031 U	***0.012***	0.0078 U	0.0078 U
MW-25	9/9/1997	--	0.003 U	--	--	--
MW-25	12/10/1997	***0.01***	--	0.0063 U	0.013 U	0.0063 U
MW-25	5/5/1998	***0.017***	0.02 U	0.0064 U	0.0064 U	0.0064 U
MW-25	10/14/1998	***0.027***	0.039 U	0.0062 U	0.012 U	0.0062 U
MW-25	6/22/1999	0.0063 U	0.04 U	0.0063 U	0.0063 U	0.0063 U
MW-25	9/29/1999	0.016 U	0.038 U	0.016 U	0.016 U	0.016 U
MW-25	6/8/2000	***0.022***	0.033 U	0.0067 U	0.0067 U	0.0067 U
MW-25	11/17/2000	***0.014***	--	0.01 U	0.01 U	0.01 U
MW-25	4/27/2001	***0.044***	0.084 U	0.007 U	0.007 U	0.007 U
MW-26	11/17/2000	***0.018***	0.046 U	0.01 U	0.01 U	0.01 U
MW-26	4/27/2001	***0.038***	0.084 U	0.007 U	0.007 U	***0.012 J***

Notes: Bold indicates detected concentration.
- - Not analyzed

ATTACHMENT 5

SURFACE WATER DATA

Attachment 5. Surface Water Data (µg/L)

Location	Date	1-Methyl-naphthalene	2,3,4,6-Tetrachloro-phenol	2,4,5-Trichloro-phenol	2,4,6-Trichloro-phenol	2-Chloro-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acenaph-thylene	Anthracene
Freshwater Acute[a]		--	--	--	--	*1600*	--	*1700*	--	--
Freshwater Chronic[a]		--	--	--	--	--	--	*520*	--	--
Human Health Criteria[a]		--	--	--	*2.1*	--	--	--	--	*9600*
ACCSW1	1/6/1997	***0.031***	***0.13***	0.031 U	0.031 U	0.0078 U	***0.022***	***0.06***	***0.019***	***0.035***
ACCSW1	9/9/1997	--	***0.008***	0.003 U	0.003 U	--	--	--	--	--
ACCSW1	12/10/1997	***0.16***	--	--	--	0.0064 U	***0.14***	***0.4***	***0.013***	***0.11***
ACCSW1	5/5/1998	***0.08***	***0.093***	***0.0065 J***	***0.018 J***	0.0065 U	***0.089***	***0.22***	0.0065 U	***0.073***
ACCSW1	10/14/1998	***0.043***	***0.0049 NJ***	***0.0016 NJ***	0.049 U	--	***0.018***	***0.5***	0.0063 U	***0.11***
ACCSW1	6/22/1999	***0.088***	0.045 U	0.049 U	0.049 U	0.0032 U	***0.1***	***0.24***	***0.0066***	***0.074***
ACCSW1	9/29/1999	***0.064***	0.045 U	0.049 U	0.049 U	0.016 U	***0.087***	***0.16***	0.016 U	***0.071***
ACCSW1	6/8/2000	***0.029***	0.038 U	0.042 U	0.042 U	0.0067 U	***0.038***	***0.1***	0.0067 U	***0.026***
ACCSW1	11/17/2000	***0.016***	0.053 U	0.058 U	0.058 U	0.01 U	***0.02***	***0.074***	0.02 U	***0.04***
ACCSW1	4/27/2001	***0.18***	0.09 U	0.098 U	0.098 U	0.007 U	***0.2***	***0.65***	0.007 U	***0.14***
ACCSW2	1/6/1997	***0.0034 J***	***0.071***	0.031 U	0.031 U	0.0078 U	0.0053 UJ	***0.0058 J***	***0.0057 J***	***0.016***
ACCSW2	9/9/1997	--	***0.004***	0.003 U	0.003 U	--	--	--	--	--
ACCSW2	12/10/1997	***0.043***	--	--	--	0.0065 U	***0.035***	***0.11***	***0.0053 J***	***0.029***
ACCSW2	5/5/1998	***0.026***	***0.068***	0.013 NJ	0.013 J	0.0065 U	***0.031***	***0.12***	0.0065 U	***0.036***
ACCSW2	10/14/1998	***0.046***	***0.016 NJ***	0.047 U	0.047 U	--	***0.048***	***0.19***	0.0063 U	***0.029***
ACCSW2	6/22/1999	***0.037***	0.045 U	0.049 U	0.049 U	0.0032 U	***0.03***	***0.12***	***0.0051***	***0.035***
ACCSW2	9/29/1999	***0.11***	0.049 U	0.054 U	0.054 U	0.016 U	***0.14***	***0.27***	0.016 U	***0.03***
ACCSW2	6/8/2000	***0.015***	0.036 U	0.04 U	0.04 U	0.0067 U	***0.013***	***0.058***	0.0067 U	***0.018***
ACCSW2	11/17/2000	***0.008 J***	0.053 U	0.057 U	0.057 U	0.01 U	***0.008 J***	***0.03***	0.01 U	***0.025***
ACCSW2	4/27/2001	***0.024***	0.097 U	0.11 U	0.11 U	0.006 U	***0.028***	***0.079***	0.006 U	***0.057***

Notes:

Bold indicates detected concentration.

- - Not analyzed.

[a] EPA, 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State Compliance Final Rule.

Attachment 5 Cont. Surface Water Data (µg/L)

Location	Date	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoran thene	Benzo(ghi) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h)a nthracene	Dibenzo- furan	Fluoran- thene
Freshwater Acute[a]		--	--	--	--	--	--	--	--	*3980*
Freshwater Chronic[a]		--	--	--	--	--	--	--	--	--
Human Health Criteria[a]		*0.0028*	*0.0028*	*0.0028*	*0.0028*	*0.0028*	*0.0028*	*0.0028*	--	*300*
ACCSW1	1/6/1997	***0.0061 J***	***0.0024 J***	***0.0071 J***	***0.0025 J***	0.0078 U	***0.014***	0.02 U	***0.021***	***0.042***
ACCSW1	9/9/1997	--	--	--	--	--	--	--	--	--
ACCSW1	12/10/1997	***0.021***	***0.013***	***0.018 J***	***0.007***	***0.0064 J***	***0.031***	***0.0012 J***	***0.1***	***0.23***
ACCSW1	5/5/1998	***0.019***	***0.006 J***	***0.02***	***0.0069 J***	***0.0066 J***	***0.026***	0.0032 U	***0.082***	***0.24***
ACCSW1	10/14/1998	***0.043***	***0.02***	***0.047***	***0.014***	***0.014***	***0.073***	0.0063 U	***0.07***	***0.46***
ACCSW1	6/22/1999	***0.017***	***0.01***	***0.012***	***0.014***	***0.012 J***	***0.024***	0.0063 U	***0.066***	***0.18***
ACCSW1	9/29/1999	***0.035***	***0.012 J***	***0.063***	***0.016 J***	***0.033***	***0.079***	0.0047 J	***0.059***	***0.26***
ACCSW1	6/8/2000	***0.0058 J***	***0.0085***	***0.0067***	***0.003 J***	***0.006 J***	***0.0075***	0.0067 U	0.0067 U	***0.055***
ACCSW1	11/17/2000	***0.013***	***0.009***	***0.018***	***0.005 J***	***0.011***	***0.03***	0.01 U	0.01 U	***0.1***
ACCSW1	4/27/2001	***0.06***	***0.16***	***0.04***	***0.009 J***	***0.19 J***	***0.08***	0.066 U	***0.14***	***0.44***
ACCSW2	1/6/1997	0.00067 J	0.0078 U	0.019 U	0.0078 U	0.0078 U	***0.0037 J***	0.019 U	***0.0024 J***	***0.012***
ACCSW2	9/9/1997	--	--	--	--	--	--	--	--	--
ACCSW2	12/10/1997	***0.0029 J***	***0.0018 J***	***0.0031 J***	***0.0016 J***	***0.0011 J***	***0.0037 J***	0.0065 U	***0.026***	***0.031***
ACCSW2	5/5/1998	***0.0057 J***	***0.0043 J***	***0.0073 J***	0.0032 U	***0.0037 J***	***0.0062 J***	0.0032 U	***0.066***	***0.047***
ACCSW2	10/14/1998	***0.0042 J***	***0.0049 J***	***0.007***	***0.0039 J***	***0.0026 J***	***0.0072***	0.0063 U	***0.091***	***0.039***
ACCSW2	6/22/1999	***0.0077***	***0.0076***	***0.0041 J***	0.0063 U	***0.0084 J***	***0.0067***	0.0063 U	***0.043***	***0.041***
ACCSW2	9/29/1999	***0.0041 J***	***0.005 J***	***0.011 J***	***0.0046 J***	***0.0051 J***	***0.0097 J***	0.016 U	***0.1***	***0.042***
ACCSW2	6/8/2000	***0.0051 J***	0.0067 U	***0.0046 J***	0.0067 U	***0.0056 J***	***0.0041 J***	0.0067 U	0.0067 U	***0.046***
ACCSW2	11/17/2000	***0.007***	0.01 U	0.01 U	0.01 U	***0.009 J***	***0.013***	0.01 U	0.01 U	***0.056***
ACCSW2	4/27/2001	0.006 U	0.006 U	0.006 U	0.006 U	0.006 UJ	0.006 U	0.006 U	***0.032***	***0.04***

Notes:

Bold indicates detected concentration.

- - Not analyzed.

[a] EPA, 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State Compliance Final Rule.

Attachment 5 Cont. Surface Water Data (µg/L)

Location	Date	Fluorene	Indeno (1,2,3-cd) pyrene	Naphthalene	Penta-chlorophenol (pH of 6.5)	Phenan-threne	Pyrene	Retene	TEF Adjusted Carcinogenic PAHs
Freshwater Acute[a]		--	--	*2300*	*5.49*	--	--	--	--
Freshwater Chronic[a]		--	--	*620*	*3.46*	--	--	--	--
Human Health Criteria[a]		*1300*	*0.0028*	--	*0.28*	--	*960*	--	0.0028
ACCSW1	1/6/1997	***0.04***	***0.0023 J***	***0.061***	***0.58***	***0.03***	***0.041***	***0.0062 J***	***0.00409***
ACCSW1	9/9/1997	--	--	--	***0.007 J***	--	--	--	--
ACCSW1	12/10/1997	***0.18***	***0.0073***	***0.29***	--	***0.065***	***0.16***	***0.017***	***0.0187***
ACCSW1	5/5/1998	***0.13***	***0.0078 J***	***0.21***	0.02 U	***0.16***	***0.12***	***0.024***	***0.0116***
ACCSW1	10/14/1998	***0.044***	***0.015***	***0.044***	***0.17***	***0.018***	***0.36***	***0.027***	**0.03263**
ACCSW1	6/22/1999	***0.15***	***0.018***	***0.088***	0.04 U	***0.22***	***0.11***	***0.018***	***0.01614***
ACCSW1	9/29/1999	***0.12***	***0.021***	***0.058***	***0.013 NJ***	***0.2***	***0.19***	***0.065***	***0.02846***
ACCSW1	6/8/2000	***0.057***	***0.0031 J***	***0.037***	0.035 U	***0.068***	***0.026***	0.0067 U	***0.010735***
ACCSW1	11/17/2000	***0.028***	***0.01***	***0.028***	0.048 U	***0.028***	***0.071***	***0.05***	***0.0145***
ACCSW1	4/27/2001	***0.3***	***0.18***	***0.15***	0.082 U	***0.15***	***0.34***	***0.09***	***0.2078***
ACCSW2	1/6/1997	***0.0055 J***	0.0078 U	***0.015***	***0.35***	***0.0085***	***0.012***	***0.00086 J***	***0.000104***
ACCSW2	9/9/1997	--	--	--	***0.005 J***	--	--	--	--
ACCSW2	12/10/1997	***0.051***	***0.0012 J***	***0.12***	--	***0.024***	***0.021***	***0.0024 J***	***0.002667***
ACCSW2	5/5/1998	***0.096***	0.0032 U	***0.11***	0.021 U	***0.11***	***0.024***	***0.021***	***0.006032***
ACCSW2	10/14/1998	***0.15***	0.0063 U	***0.24***	***0.024 NJ***	***0.096***	***0.022***	0.0063 U	***0.006352***
ACCSW2	6/22/1999	***0.086***	0.013 U	***0.099***	0.041 U	***0.096***	***0.018***	0.0063 U	***0.009687***
ACCSW2	9/29/1999	***0.17***	***0.0044 J***	***0.62 J***	0.045 U	***0.11***	***0.025***	***0.0035 J***	***0.007557***
ACCSW2	6/8/2000	***0.039***	0.0067 U	***0.016***	0.033 U	***0.047***	***0.021***	0.0067 U	***0.001571***
ACCSW2	11/17/2000	***0.025***	0.01 U	***0.012 J***	0.048 U	***0.028***	***0.034***	0.01 U	***0.00173***
ACCSW2	4/27/2001	***0.059***	0.006 U	***0.11***	0.088 U	***0.035***	***0.006 J***	0.006 U	--

Notes:

Bold indicates detected concentration.

- - Not analyzed.

[a] EPA, 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State Compliance Final Rule.

ATTACHMENT 6

COMMITMENT FOR TITLE INSURANCE

ATTACHMENT 7

TITLE EXCEPTIONS REVIEW

REVIEW OF TITLE EXCEPTIONS
AMERICAN CROSSARM & CONDUIT SUPERFUND SITE
FOR COMPLIANCE WITH PROTECTIVE COVENANTS

Date of Review: August 20, 2009 | Effective Date of Title Report: March 25, 2009

PARCEL # 005274003000

Exception #	Schedule B Special Title Exceptions	Recording Date of Instrument	Rights Granted	Impact to Covenant Dated August 18, 1997
4	Easement to PUD No.1 of Lewis County Auditor's File No.909356	March 4, 1983	Overhead and underground utilities, guy wires, and an access road.	Easement pre-dates EPA's Protective covenant. Full exercise of these rights could impact use restrictions on the property although only a very small portion of the CERCLA cap coincides with the easement.
5	Protective Covenants Auditor's File No. 3025613	August 18, 1997	Prohibits groundwater wells, residential or agricultural use and intrusive activities below ground.	None, this is the subject Protective covenant.
6	Administrative Order Auditor's file No. 3025614	August 18, 1997	EPA orders compliance with use restrictions, recording of Protective Covenant and imposes future deed requirements.	None, this is the authority for the Protective covenant.
7	Warranty Deed from Peterson to Simon Auditor's file No. 3099851	August 21, 2000	Conveyed fee interest from Peterson to Simon but reserved a 10" sewer line easement.	Full exercise of these rights could impact use restrictions on the property. Deed does not comply with Administrative Order Section VII c as it does not contain the use restrictions. Easement post-dates EPA's Protective Covenant and in the event of a conflict, Protective Covenant supersedes easement.
N/A	Quit claim deed from Simon to B&D Inc. Auditor's file 3243327	January 31, 2006	Conveyed fee interest from Simon to B & D Inc., NW.	None, but deed does not comply with Administrative Order, Section VII c as it does not contain the use restrictions.
N/A	Quit claim deed from B&D Inc to Simon Auditor's file 3252594	May 25, 2006	Conveyed fee interest from B & D, Inc. NW back to Simon	None, but deed does not comply with Administrative Order, Section VII c as it does not contain the use restrictions.

REVIEW OF TITLE EXCEPTIONS
AMERICAN CROSSARM & CONDUIT SUPERFUND SITE
FOR COMPLIANCE WITH PROTECTIVE COVENANTS

Date of Review: August 20, 2009

Effective Date of Title Report: March 25, 2009

PARCEL # 005274004001

Exception #	Schedule B Special Title Exceptions	Recording Date of Instrument	Rights Granted	Impact to Covenant Dated August 18, 1997
4 & 5	Deed of Trusts between D&K Properties & U.S. Bank Auditor's file #3303292, 3322536	April 7, 2008	Secured loans in the amount of $1,217,700 and $390,000.	None, but conveyance does not comply with Administrative Order, Section VII c as it does not contain the use restrictions.
6	Easement to PUD of Lewis County Auditor's File No.909356	March 4, 1983	Overhead and underground utilities, guy wires, and an access road.	None. Easement pre-dates EPA's Protective covenant however easement location is well north of this parcel.
7	Protective Covenants recorded under Auditor's File No. 3025613	August 18, 1997	Prohibits groundwater wells, residential or agricultural use and intrusive activities below ground.	None, this is the subject covenant.
8	Administrative Order Auditor's file No. 3025614	August 18, 1997	EPA orders compliance with use restrictions, recording of Protective Covenant and imposes future deed requirements.	None, this is the authority for the Protective covenants.
N/A	Warranty Deed from Peterson to Pullin Auditor's file 3144630	August 2, 2002	Conveyed fee interest from Peterson to Pullin	None, but deed does not comply with Administrative Order, Section VII c as it does not contain the use restrictions.
N/A	Quit Claim deed from Pullin to D&K Properties Auditor's file 3147537	September 12, 2002	Conveyed fee interest from Pullin to D & K Properties, Inc.	None, but deed does not comply with Administrative Order, Section VII c as it does not contain the use restrictions.
9	Improvement Deferral Agreement, recorded under Auditor's File 3152142	November 12, 2002	Owner agrees to participate in future street improvements.	None, outside of the covenant area.

10	Easement between Peterson, Pullin& White Auditor's file 3168691	June 5, 2003	Ingress and egress and to locate a water line. Document also references improvements in the form of an asphalt road and landscaping.	Full exercise of these rights could impact use restrictions on the property. Easement post-dates EPA's Protective Covenant and in the event of a conflict, Protective Covenant supersedes easement.
11	Memorandum and Subordination of Lease from D&K to Thorbecke's Auditor's file 3186487	December 23,2003	Provides notice of a Lease from D & K Properties, Inc. to Thorbecke's Chehalis and the Subordination of that lease for a loan.	None but without seeing the actual lease it cannot be determined whether it complies with the Administrative Order, Section VII c

REVIEW OF TITLE EXCEPTIONS
AMERICAN CROSSARM & CONDUIT SUPERFUND SITE
FOR COMPLIANCE WITH PROTECTIVE COVENANTS

Date of Review: August 20, 2009

Effective Date of Title Report: March 25, 2009

PARCEL # 005274004002

Exception #	Schedule B Special Title Exceptions	Recording Date of Instrument	Rights Granted	Impact to Covenant
4	Easement to PUD of Lewis County Auditor's File No.909356	March 4, 1983.	Overhead and underground utilities, guy wires, and an access road.	None. Easement pre-dates EPA's Protective covenant however easement location is well north of this parcel.
5	Protective Covenants recorded under Auditor's File No. 3025613	August 18, 1997.	Prohibits groundwater wells, residential or agricultural use and intrusive activities below ground.	None, this is the subject covenant.
6	Administrative Order Auditor's file No. 3025614	August 18, 1997.	EPA orders compliance with use restrictions, recording of Protective Covenant and imposes future deed requirements.	None, this is the authority for the Protective covenant.
7	Easement between Peterson, Pullin & White Auditor's file 3168691	June 5, 2003.	Ingress and egress and to locate a water line. Document also references improvements in the form of an asphalt road and landscaping.	Full exercise of these rights could impact use restrictions on the property. Easement post-dates EPA's Protective Covenant and in the event of a conflict, Protective Covenant supersedes easement.

ATTACHMENT 8

SITE INSPECTION CHECKLIST

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: American Crossarms and Conduit	**Date of inspection:** 23 January 2009
Location and Region: Chehalis, WA/Region 10	**EPA ID:** WAD057311094
Agency, office, or company leading the five-year review: EPA Region 10	**Weather/temperature:** Cold, mid-30s. Cloudy with some sunbreaks

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other ______________________
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** ____________ ____________ ____________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ____________
   Problems, suggestions; ☐ Report attached ______________________

2. **O&M staff** ____________ ____________ ____________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ____________
   Problems, suggestions; ☐ Report attached ______________________

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________
Contact ______________________ ______________ ________ __________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____________________________________

Agency ______________________
Contact ______________________ ______________ ________ __________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____________________________________

Agency ______________________
Contact ______________________ ______________ ________ __________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____________________________________

Agency ______________________
Contact ______________________ ______________ ________ __________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____________________________________

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☒ O&M manual — ☒ Readily available ☐ Up to date ☐ N/A
   - ☒ As-built drawings — ☒ Readily available ☐ Up to date ☐ N/A
   - ☐ Maintenance logs — ☐ Readily available ☐ Up to date ☐ N/A

   Remarks_______________

2. **Site-Specific Health and Safety Plan** — ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Contingency plan/emergency response plan — ☐ Readily available ☐ Up to date ☒ N/A

   Remarks_______________

3. **O&M and OSHA Training Records** — ☐ Readily available ☐ Up to date ☒ N/A

   Remarks_______________

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Effluent discharge — ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Waste disposal, POTW — ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Other permits_______________ — ☐ Readily available ☐ Up to date ☐ N/A

   Remarks_______________

5. **Gas Generation Records** — ☐ Readily available ☐ Up to date ☒ N/A

   Remarks_______________

6. **Settlement Monument Records** — ☐ Readily available ☐ Up to date ☒ N/A

   Remarks_______________

7. **Groundwater Monitoring Records** — ☒ Readily available ☐ Up to date ☐ N/A

   Remarks_______________

8. **Leachate Extraction Records** — ☐ Readily available ☐ Up to date ☒ N/A

   Remarks_______________

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Water (effluent) — ☐ Readily available ☐ Up to date ☒ N/A

   Remarks_______________

10. **Daily Access/Security Logs** — ☐ Readily available ☐ Up to date ☒ N/A

    Remarks_______________

IV. O&M COSTS: *No O&M costs incurred within the last 5 years.*
1. **O&M Organization** ☐ State in-house ☐ Contractor for State ☐ PRP in-house ☐ Contractor for PRP ☐ Federal Facility in-house ☐ Contractor for Federal Facility ☐ Other______
2. **O&M Cost Records** ☐ Readily available ☐ Up to date ☐ Funding mechanism/agreement in place Original O&M cost estimate______ ☐ Breakdown attached Total annual cost by year for review period if available From______ To______ ______ G Breakdown attached Date Date Total cost From______ To______ ______ G Breakdown attached Date Date Total cost From______ To______ ______ G Breakdown attached Date Date Total cost From______ To______ ______ G Breakdown attached Date Date Total cost From______ To______ ______ G Breakdown attached Date Date Total cost
3. **Unanticipated or Unusually High O&M Costs During Review Period** Describe costs and reasons: ______
V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A
A. Fencing
1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A Remarks: *Fencing that once surrounded the property is no longer on-Site since the Site became developed.*
B. Other Access Restrictions
1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A Remarks: *Signs that once delineated the Site are no longer present since the Site became developed.*

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) ______
Frequency ______
Responsible party/agency ______
Contact ______ ______ ______ ______
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☒ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☒ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☒ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks: *Site ICs are recorded in the Lewis County Register of Deeds. ICs include: prohibiting the installation of groundwater wells; prohibiting the rezoning of the property for agricultural or residential development; and restrictions on intrusive activities.*

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks______

2. **Land use changes on site** ☐ N/A
Remarks:
Since the 1996 remedial action, the former mill and treatment areas have been developed. The development covers the cap and drainage swales placed at the end of the remedial action.

3. **Land use changes off site** ☐ N/A
Remarks:
Land use surrounding the Site remains the same since the remedial action. The dairy facility is still present to the north of the Site, the residential neighborhood remain to the northeast and east of the Site, the wetlands to the south remain, as well as the rail line to the west.

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks______

B. Other Site Conditions	
	Remarks:

VII. LANDFILL COVERS ☒ Applicable ☐ N/A	
A. Landfill Surface	
1.	**Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident Areal extent______ Depth______ Remarks______
2.	**Cracks** ☐ Location shown on site map ☒ Cracking not evident Lengths______ Widths______ Depths______ Remarks______
3.	**Erosion** ☐ Location shown on site map ☒ Erosion not evident Areal extent______ Depth______ Remarks: *Although erosion is not evident, it appears that the eastern side of the landfill has been moved in recent years with resulting piles of materials along the eastern side. No evidence of materials buried in the landfill were observed.*
4.	**Holes** ☐ Location shown on site map ☒ Holes not evident Areal extent______ Depth______ Remarks______
5.	**Vegetative Cover** ☒ Grass ☒ Cover properly established ☒ No signs of stress ☐ Trees/Shrubs (indicate size and locations on a diagram) Remarks: *Grass is very well established on the landfill. Along the southern edge of the landfill are trees, shrubs, and blackberry bushes.*
6.	**Alternative Cover (armored rock, concrete, etc.)** ☒ N/A Remarks______
7.	**Bulges** ☐ Location shown on site map ☒ Bulges not evident Areal extent______ Height______ Remarks______
8.	**Wet Areas/Water Damage** ☒ Wet areas/water damage not evident ☐ Wet areas ☐ Location shown on site map Areal extent______ ☐ Ponding ☐ Location shown on site map Areal extent______ ☐ Seeps ☐ Location shown on site map Areal extent______ ☐ Soft subgrade ☐ Location shown on site map Areal extent______ Remarks______
9.	**Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability Areal extent______ Remarks______

B. Benches ☐ Applicable ☒ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1. **Flows Bypass Bench** Remarks____	☐ Location shown on site map	☐ N/A or okay	
2. **Bench Breached** Remarks____	☐ Location shown on site map	☐ N/A or okay	
3. **Bench Overtopped** Remarks____	☐ Location shown on site map	☐ N/A or okay	
C. Letdown Channels ☐ Applicable ☒ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1. **Settlement** Areal extent____ Depth____ Remarks____	☐ Location shown on site map	☐ No evidence of settlement	
2. **Material Degradation** Material type____ Areal extent____ Remarks____	☐ Location shown on site map	☐ No evidence of degradation	
3. **Erosion** Areal extent____ Depth____ Remarks____	☐ Location shown on site map	☐ No evidence of erosion	

4.	**Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting Areal extent______________ Depth____________ Remarks____
5.	**Obstructions** Type____________________ ☐ No obstructions ☐ Location shown on site map Areal extent______________ Size____________ Remarks____
6.	**Excessive Vegetative Growth** Type____________________ ☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent______________ Remarks____
D.	**Cover Penetrations** ☐ Applicable ☒ N/A
1.	**Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A Remarks____

E. Gas Collection and Treatment	☐ Applicable ☒ N/A
1.	**Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks______________________________
2.	**Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks______________________________
3.	**Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks______________________________
F. Cover Drainage Layer	☐ Applicable ☒ N/A
1.	**Outlet Pipes Inspected** ☐ Functioning ☐ N/A Remarks______________________________
2.	**Outlet Rock Inspected** ☐ Functioning ☐ N/A Remarks______________________________
G. Detention/Sedimentation Ponds	☐ Applicable ☒ N/A
1.	**Siltation** Areal extent______ Depth______ ☐ N/A ☐ Siltation not evident Remarks______________________________
2.	**Erosion** Areal extent______ Depth______ ☐ Erosion not evident Remarks______________________________
3.	**Outlet Works** ☐ Functioning ☐ N/A Remarks______________________________
4.	**Dam** ☐ Functioning ☐ N/A Remarks______________________________

H. Retaining Walls	☐ Applicable ☒ N/A
1.	**Deformations** ☐ Location shown on site map ☐ Deformation not evident Horizontal displacement_______ Vertical displacement_______ Rotational displacement_______ Remarks_______
2.	**Degradation** ☐ Location shown on site map ☐ Degradation not evident Remarks_______
I. Perimeter Ditches/Off-Site Discharge	☐ Applicable ☒ N/A
1.	**Siltation** ☐ Location shown on site mapG Siltation not evident Areal extent_______ Depth_______ Remarks_______
2.	**Vegetative Growth** ☐ Location shown on site map ☐ N/A ☐ Vegetation does not impede flow Areal extent_______ Type_______ Remarks_______
3.	**Erosion** ☐ Location shown on site map ☐ Erosion not evident Areal extent_______ Depth_______ Remarks_______
4.	**Discharge Structure** ☐ Functioning ☐ N/A Remarks_______
VIII. VERTICAL BARRIER WALLS	☐ Applicable ☒ N/A
1.	**Settlement** ☐ Location shown on site map ☐ Settlement not evident Areal extent_______ Depth_______ Remarks_______
2.	**Performance Monitoring** Type of monitoring_______ ☐ Performance not monitored Frequency_______ ☐ Evidence of breaching Head differential_______ Remarks_______

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks__________
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks__________
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks__________
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks__________
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks__________
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks__________

C. Treatment System ☐ Applicable ☒ N/A
1. **Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☐ Filters____________ ☐ Additive (*e.g.*, chelation agent, flocculent)____________ ☐ Others____________ ☐ Good condition ☐ Needs Maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually____________ ☐ Quantity of surface water treated annually____________ Remarks____________
2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks____________
3. **Tanks, Vaults, Storage Vessels** ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks____________
4. **Discharge Structure and Appurtenances** ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks____________
5. **Treatment Building(s)** ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks____________
6. **Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks____________
D. Monitoring Data: *No groundwater monitoring sampling has occurred since 2001.*
1. Monitoring Data ☐ Is routinely submitted on time ☐ Is of acceptable quality
2. Monitoring data suggests: ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation
1. **Monitoring Wells** (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☒ N/A Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy removed the more highly contaminated material from the former treatment and mill areas and the stormwater lagoon. Low-level contamination from residential yards caused by past flood events which moved contaminated material off-Site was removed and placed on-Site in excavated areas as backfill. A soil cover was placed on the entire Site (treatment, mill, and landfill areas). No remediation occurred at the adjacent wetlands or Dillenbaugh Creek. No remediation occurred at the landfill. The remedy currently functions as designed. The soil cap on top of the former mill and treatment areas has been developed in recent years. The developer placed an additional 5 feet of material on top of the soil cap to prevent compromising the cap. All utilities for the development are within this additional material. Groundwater monitoring that occurred from 1996 to 2001 showed levels of PAHs below cleanup criteria.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Annual inspections required by the O&M plan have not occurred, with the exception of the visual inspection of the storm water lagoon by the City of Chehalis. Annual inspections required under the O&M plan should be conducted to ensure current and long-term protectiveness of the remedy. Because of the change in Site conditions over the years, the O&M plan should be revised to reflect these changes. No groundwater samples have been collected since 2001. The institutional controls have been put in place and currently recorded with the Lewis County Register of Deeds. These controls prohibit the installation of groundwater wells and rezoning of the property for agriculture or residential development, and restrict intrusive activity. These controls ensure long-term protectiveness of the remedy.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. *None.*
	D. Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

ATTACHMENT 9

REVIEW OF THE 1992 AMERICAN CROSSARM AND CONDUIT HUMAN HEALTH RISK ASSESSMENT

ATTACHMENT 10

ARARs REVIEW SUMMARY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

September 17, 2009

MEMORANDUM

SUBJECT: Review of the 1992 American Crossarm and Conduit Human Health Risk Assessment and Evaluation of ROD Cleanup Levels and ARARS

FROM: Dana Davoli, Senior Risk Assessor

TO: Anne McCauley, Remedial Project Manager

(I) Review of the 1992 Human Health Risk Assessment Done for American Crossarm and Conduit:

The 1992 HHRA done for the American Crossarm and Conduit (ACC) site was reviewed to determine if changes in EPA regulation, guidance or policy; toxicity values; or exposure scenarios and exposure assumptions would impact the site risks and the remedial actions taken.

Four different scenarios were evaluated in the HHRA:

(1) Current residential exposure to the area bordering the ACC facility (Chehalis Avenue area);
(2) Future residential exposure to the ACC facility treatment area;
(3) Current trespasser exposure to the ACC facility treatment area, and;
(4) Future industrial exposure to the ACC facility treatment area, mill and landfill areas.

It was assumed that scenarios 2 and 3 are no longer relevant as the site is capped and there can be no exposures for trespassers. Residential exposures to the ACC facility cannot occur due to land use restrictions. Therefore, this review was focused on the 2 remaining scenarios, Current Residential Exposure in the area bordering the facility (Chehalis Avenue area) and Future Industrial Exposure to the ACC facility treatment area, mill and landfill areas.

It should be noted that three exposure pathways were considered but eliminated from evaluation in the HHRA because "it is unlikely that significant exposure can occur now or in the future":

- Ingestion, inhalation, or dermal contact with groundwater because the source of drinking water for workers and residents in the area was not being impacted by ACC nor expected to be in the future.
- Human consumption of fish or invertebrates caught in the vicinity of the facility.
- Consumption of waterfowl that feed in the area

The second of these three exposure pathways is discussed in more detail later in this discussion.

(A) Residential Exposure Scenario in the 1992 ACC HHRA

For this current residential scenario in the area surrounding the ACC facility, six different exposure pathways were evaluated in the ACC HHRA:

- Incidental ingestion of soil
- Inhalation of particulates and vapors
- Dermal contact with soil
- Ingestion of garden fruits and vegetables
- Incidental ingestion of surface water while swimming
- Incidental ingestion of creek sediment

Due to the uncertainties in these pathways, dermal contact from soil and ingestion of fruits and vegetables were only evaluated in the uncertainty analysis and the risks from these pathways were not used further to define remediation levels. In addition, dermal contact to Dillenbaugh Creek sediment was not evaluated in the HHRA.

For incidental ingestion of soil and inhalation of dust, risks for 3 age groups were assessed (ages 0 to 6, 6 to 18, and 18 to 75 years). For incidental exposure to water and sediments while swimming, only 6 to 18 year olds were evaluated because youths of this age had been observed playing in the creek during the summer.

For the four exposure pathways evaluated in the risk characterization, the primary risk drivers for cancer risk were chlorinated dioxins/furans and cPAHs. Incidental ingestion of soil had the highest risk followed by incidental sediment ingestion (for the 6 to 18 year old group). The combined cancer risk from living in the area for 0 to 75 years of age was 2×10^{-4}. The non-cancer Hazard Quotients (HQ) were less than 1 for all age groups.

(1) Residential Exposures from Incidental Ingestion of Soil, Inhalation of Particulates and Vapors, and Dermal Contact with Soil

Changes in EPA guidance, toxicity factors and exposure assumptions that have occurred since the 1992 HHRA for ACC that could impact the risks estimated in the residential area yards are discussed below. Based upon a screening of the contaminants in the residential soils, only three contaminants, cPAHs, chlorinated dioxins/furans, and pentachlorophenol, were identified as potential contaminants of concern for the HHRA. Because non-cancer Hazard Indices were well below 1 and the majority of the cancer risks (>90%) were due to cPAHs and chlorinated dioxins/furans, the discussion that follows is focused on cancer risks for these two chemicals.

(a) Changes Related to Toxicity Related Factors:

Toxicity Factors - Some of the toxicity factors that were used for calculating risks from soil ingestion (done in the risk characterization section of the HHRA) and from dermal absorption (done only in the uncertainty section of the HHRA) in the HHRA have changed since 1993 (see Regional EPA Screening Tables at: http://www.epa.gov/reg3hwmd/risk/human/rb-Concentration_table/Generic_Tables/index.htm).

For example, the oral cancer slope factor used for cPAHs (i.e., B(a)P) in the HHRA has been reduced from 11 to 7.3 per mg/kg-day which is the California EPA value. There are no RfDs for the cPAHs. The cancer slope factor for 2,3,7,8-TCDD has been reduced from 1.6 X 10^5 to 1.3 X 10^5 (California EPA value). Use of the original 1.6 X 10^5 is also acceptable. There is now an oral RfD of 1 X 10^{-9} (mg/kg-day) listed for 2, 3, 7, 8-TCDD in the Regional EPA Screening Tables.

Inhalation Guidance - EPA OSWER recently released Risk Assessment Guidance for Superfund (RAGS), Part F: Supplemental Guidance for Inhalation Risk Assessment. Air exposures are now evaluated using Reference Concentrations for non-cancer effects and Inhalation Unit Risk values for cancer endpoints rather than the previous intake-based approach used by the inhalation component of RAGS Part A.

Toxic Equivalency Factors for cPAHs and chlorinated dioxins/furans - For the risk assessment, it was assumed that all cPAHs had the same potency value as B(a)P. This is a very health protective assumption as an exposure point calculation done using TEFs for cPAHs would be lower (see further discussion below).

For the chlorinated dioxins and furans, the RI stated that a TEQ approach was used to calculate 2,3,7,8-TCDD TEQ. However, neither the RI nor the HHRA list the TEF values used. For this document, it was assumed that the NATO 1989 TEFs which had been adopted by EPA in 1989 were used.

A comparison was done between the NATO 1989 TEF likely used in the HHRA for ACC and the latest TEFs developed in 2005 by the World Health Organization. This comparison focused on the hepta and octa chlorinated dioxins and furans as these are the predominant congener groups in technical grade pentachlorophenol used by wood treaters. As can be seen below, the TEF values for these congener groups has either not changed since 1989 or they have decreased in value. Therefore, cancer risk using the current WHO TEQ values would have been lower than those using the NATO 1989 TEQ.

Toxicity Equivalency Factors (TEFs) for Human Health

	NATO 1989	WHO 2005
1,2,3,4,6,7,8 - HpCDD	0.1	0.01
OCDD	0.001	0.0003
1,2,3,4,6,7,8-HpCDF	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01
OCDF	0.001	0.0003

(b) Changes in Exposure Scenarios and/or Exposure Assumptions

The exposure assumptions used for inadvertent residential soil ingestion, inhalation of dust, and dermal absorption in the residential areas were reviewed. The majority of the equations and parameters are consistent with current guidelines. There are some exceptions, including:

Dermal Exposure - EPA OSWER released dermal guidance subsequent to the ACC HHRA: Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. Based upon this guidance, dermal exposures would now be included in the risk characterization from exposure to residential soils (as well as Dillenbaugh Creek sediments) rather than being limited to the discussion in the Uncertainty Section of the HHRA. In addition, the risk calculations for the ACC HHRA would be impacted by the new exposure values in the Superfund Dermal Guidance. The Uncertainty Section of the ACC HHRA has a very long discussion on dermal exposure. Both a risk characterization (which provides estimates of risk from dermal exposure) and a sensitivity analysis were done for this pathway using varying toxicity and exposure assumptions.

Mutagenic Mode of Action (MOA) for cPAHs - Chemicals that have been determined to cause cancer by a mutagenic mode of action (MOA) are thought to pose a higher risk during early life. An EPA-recommended procedure exists for assessing risks from these chemicals. Of the COCs in the residential exposure scenario in the ACC HHRA, only cPAHs have been determined to have a MOA. For chemicals like cPAHs, where chemical-specific data on susceptibility from early-life exposures is not available, EPA guidance requires that Age Dependent Adjustment Factors (ADAFs) be applied in calculating or estimating risks associated with early-life exposures (*Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens* (USEPA, 2005b)) recommends that the following default ADAFs be applied in risk assessments:

- 10-fold adjustment for exposures during the first 2 years of life;
- 3-fold adjustment for exposures from ages 2 to <16 years of age; and
- No adjustment for exposures after turning 16 years of age.

(c) Impact of Changes on Residential Exposures and Risks from Incidental Ingestion of Soil, Inhalation of Particulates and Vapors, and Dermal Contact with Soil

The soil concentrations used in calculating the Reasonable Maximum Exposure (RME) and risks in the HHRA for pentachlorophenol, cPAHs, and chlorinated dioxins/furans were found on the computer disk attached to the RI. An easy way to check how changes in EPA risk assessment methods and values (toxicity and exposure) made since the HHRA was done might impact the residential yard risks in the ACC HHRA is to use the EPA Residential Soil Regional Screening Level Values (SLVs) to calculate risks using the residential soil concentrations (95% UCL on the average) used in the ACC HHRA. The risks calculated with the Regional Residential Soil Regional SLVs take into account new EPA guidance and toxicity/exposure values that have occurred since the ACC HHRA was done.

Table 1 shows the results of this evaluation. The RME soil concentration values used for the ACC residential soil HHRA (incidental ingestion and inhalation) were 1.4 mg/kg for pentachlorophenol, 4 mg/kg for cPAHs, and 3.7×10^{-4} mg/kg for chlorinated dioxins/furans (from the computer disc attached to the RI). The resultant total lifetime cancer risk (for ages 0 to 75 years) in the ACC HHRA was 2×10^{-4} for the soil ingestion and inhalation pathways. When dermal absorption risks, which were only calculated and discussed in the uncertainty section of the HHRA, are added to the ingestion and inhalation pathways, the total risk was 1.8×10^{-3}. The current Regional Residential Soil Regional SLVs and the ACC HHRA residential soil concentration were used to calculate the total lifetime cancer risks from residential exposure to pentachlorophenol, B(a)P TEQ, and 2,3,7,8-TCDD. This resultant cancer risk is 3.5 X 10^{-4}. This risk of 3.5 X 10^{-4} is about 2 fold greater than the risk estimated in the HHRA for ingestion and inhalation only; and about 5 times less than the risk estimated in the HHRA for ingestion of soil, inhalation and dermal exposure. In summary, the recalculated ACC residential risks, taking into account new guidance and toxicity/exposure values and adding the dermal pathway, are only about 2 fold higher than those risks calculated in the ACC HHRA (ingestion and dermal only). This modest increase in cancer risk would not have any impact on the decision to take action in the residential areas based on the ACC HHRA.

The non-cancer evaluations in the ACC HHRA showed Hazard Indices that were well below 1 for the current residential exposure scenario. However, as noted above, an oral RfD for 2,3,7,8-TCDD of 1 x 10^{-9} mg/kg-day is now available in the Regional Residential Soil Regional tables. The soil concentration value of 3.7 X 10^{-4} mg/kg levels for 2,3,7,8-TCDD TEQ used in the ACC HHRA for calculating risks for the current residential exposures would result in a Hazard Quotient of approximately 5 using this RfD. This result would not impact the protectiveness of the remedy in the residential areas, since as discussed below, all yards with cancer risks above 1 x 10^{-6} were remediated.

<u>(d) Ingestion of Vegetables</u> -Due to the uncertainty with the uptake of contaminants by fruits and vegetables, this pathway was only included in the Uncertainty Section of the ACC HHRA. Even with the addition of risks from the vegetable pathway, the remedy is likely to be protective (within a cancer risk of 10^{-4} to 10^{-6}) because, as described later in this document, remediation was done to achieve the 10^{-6} level MTCA clean-up values. More recent guidance from EPA (e.g., EPA's *Human Health Risk Assessment Protocol for Hazard Waste Combustion Facilities)* may address these uncertainties in this pathway.

<u>(2) Residential Exposures and Risks from Incidental Ingestion of Sediment and Surface Water in Dillenbaugh Creek</u>

The ACC HHRA residential scenario included an assessment of the exposures and risks for 6 to 18 year olds who were considered to be the group most likely to play in Dillenbaugh Creek. The total risk for this age group from ingestion of Dillenbaugh sediment and water was 2 x 10^{-5}. Dermal exposure was not considered. No remedial action was taken in the Creek itself, however, actions were taken to reduce the levels of contaminants found in the Creek (e.g., removing sediment in the lagoon and stormwater sewer, ACC site remediation of soil and groundwater, etc.). Recent data are available only on the concentrations of chlorinated dioxins/furans in the Creek. As a part of the determination of the effectiveness of the remedy done during the next 18 months, additional analyses of Dillenbaugh Creek risks for direct contact (ingestion and dermal) with sediment using the most recent chlorinated dioxin/furan data will be done.

<u>(3) Conclusion</u>

Based upon the above, the contaminants evaluated and the risk estimates that were calculated in the ACC HHRA and used for decision-making in the FS for the residential (Chehalis Ave) area (soil clean-up and capping) would not be impacted substantially by new guidance or more current toxicity data and exposure assumptions, as the cancer risks from soil exposures in the residential areas are only two fold higher using the most recent guidance and values.

(B) Exposure Scenarios Not Evaluated in the 1992 HHRA or Used for Decision-Making in the ROD

Three exposure scenarios not evaluated in the HHRA are discussed below. These include human consumption of biota from Dillenbaugh Creek near the ACC facility, consumption of drinking water from Dillenbaugh Creek, and potential for vapor intrusion into buildings built on the ACC site after remediation.

(1) Human consumption of Biota Caught in the Vicinity of the Facility

Risk from human consumption of biota potentially contaminated as a result of bioaccumulation of ACC site related contaminants in sediment and water in Dillenbaugh Creek was not evaluated in the HHRA because, as stated in the HHRA, "it is unlikely that significant exposure can occur now or in the future". However, based upon the discussion below, EPA has decided to include this pathway as a part of the 5-year review process.

For the ACC RI, sediment samples were collected from Dillenbaugh Creek, the stormwater discharge lagoon, wetlands, and the Chehalis River. The major contaminants found were dioxins, PAHs, and PCP. The highest concentrations were observed at the stormwater discharge lagoon and in Dillenbaugh Creek immediately downstream of the stormwater discharge lagoon. Following the ROD, as part of a screening level study to determine if residual contamination remained in the area near the ACC site, the Washington Department of Ecology collected sediment and fish samples from Dillenbaugh Creek in 1998 and documented the results in a 2002 report. A follow-up study was completed in 2004 and described in a 2005 report.

For this report, EPA decided to perform a risk screening analysis for this pathway by comparing the levels of dioxins in Dillenbaugh Creek sediment to appropriate ARARs or risk based values (e.g., bioaccumulative sediment criteria and/or standards). Neither EPA nor the State of Washington has such criteria or standards. However, the Oregon Department of Environmental Quality (ODEQ) has published *Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment* (http://www.deq.state.or.us/lq/pubs/docs/cu/GuidanceAssessingBioaccumulative.pdf). This document contains health protective risk-based Sediment Bioaccumulation Screening Level Values (SLVs). As a first step in calculating the ODEQ SLVs, acceptable tissue levels in fish consumed by humans were calculated using 2 fish consumption rates (17.5 and 142 grams per day) and a risk level of 1×10^{-6} and hazard quotient of 1. The lowest acceptable fish tissue values were used with literature derived Biota Sediment Accumulation Factors (BSAFs) (75^{th} % values of acceptable BSAFs in the literature) to derive acceptable SLVs for both consumption rates (17.5 and 142 grams per day). The ODEQ SLVs for 2,3,7,8-TCDD were compared to the 2,3,7,8- TCDD TEQ concentrations in sediments in Dillenbaugh Creek and the Chehalis River that were in the RI and in the 1991, 1998, and 2004 sediment studies done by WDOE. This comparison is shown in Table 2a. It should be noted that, as presented in the discussion above, the TEFs for chlorinated dioxins and furans have changed over time; however, the TEFs of the congeners of most interest to wood treating facilities (hepta and octa congeners) have not changed appreciably. The results of this comparison show that the levels of chlorinated dioxin/furans in Dillenbaugh sediment downstream of the site are not only elevated above sediments levels upstream of the site and in the Chehalis river, but they are also well above ODEQ's risk-based human health SLVs for 2,3,7,8- TCDD. For example, from the WDOE 2005 Report (the most recent sampling), 2,3,7,8-TCDD TEQ ranged from 3.7 to 790 pg/g with the highest levels just downstream of the stormwater lagoon. "Background" levels ranged from <.0.1 to 8.2 pg/g. The ODEQ SLVs are 0.009 and 0.001 pg/g for fish consumption rates of 17.5 and 1422 grams per day, respectively. It should be noted that the ODEQ SLVs are very health protective (e.g., based on a cancer risk level of 1 X 10^{-6}) and are below all of the "background levels" observed in Dillenbaugh Creek and the Chehalis River.

In its 2002 Report, Ecology also included data for a small number of fish samples collected from Dillenbaugh Creek and the Chehalis River. The number and types of fish samples (see Table 2b) were too small to screen for impacts to humans who may consume fish from Dillenbaugh Creek downstream from the site. However, it should be noted that the 2002 Ecology data show higher levels of chlorinated dioxins/furans in data from fish in the vicinity of the ACC facility than those from the Chehalis River.

The State of Washington water quality standards have a mix of designations in the Chehalis River Basin. Dillenbaugh Creek, which is in the Chehalis River Basin, is designated Core Summer Salmonid Habitat (which includes spawning) with Primary Contact Recreation. All free flowing waters in the state, including the Creek, are designated as "Harvesting" which includes fishing. As discussed above, Ecology sampling for dioxins/furans in Dillenbaugh Creek sediments showed levels above background in the sediments downstream of the ACC facility in Dillenbaugh Creek and in fish samples from the creek near the ACC facility taken in 1998. Based upon the dioxin/furan levels in a composite of Cutthroat Trout fillet from the 1998 Ecology sampling, the Dillenbaugh Creek is listed as impaired under the CWA 303(d) program. (The creek is also listed due to fecal coliform levels and problems with temperature and low oxygen levels).

Based upon the state's use designation of "harvesting" and the presence of chlorinated dioxins/furans in the sediments samples collected in 1998 and 2004 downstream of the ACC facility in Dillenbaugh Creek that could bioaccumulate into fish tissue in the Creek, human consumption of biota from Dillenbaugh Creek will be evaluated as apart of the 5-year review process.

Part1, Volume 1, of the US EPA document, *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds National Academy Sciences (NAS) Review Draft* (December 2003), contains information on the sources of dioxin-like compounds in the US. In Section 8.3.8 (page 8-28) wood-treating facilities are discussed. This discussion includes a compilation of published data on the chlorinated dioxin and furan congeners in technical grade pentachlorophenol (the type likely used by ACC). The predominant congener groups are octa dioxins and furans and hepta dioxin and furans. A review of the sediment data in the WDOE 2005 report, in which all of the samples were from Dillenbaugh Creek, shows that the predominant congeners in the sediment samples are the hepta and octa isomers of dioxins/furans, suggesting that the ACC site is a potential source of the dioxin/furan sediment contamination in samples collected in 1998 and 2004.

(2) Dillenbaugh Creek as a Drinking Water Source

Although the use designation for Dillenbaugh Creek includes Domestic Water Supply Use, no one is using the water now for this purpose, nor are there any plans to do so in the future. However, potential ARARs for the Creek (see next section) should include MTCA B regulations for surface water as a drinking water source and the federal and state MCLs.

(3) Potential Exposures Due to Vapor Intrusion in the ACC Facility Treatment Area, Mill and Landfill Areas

The future industrial exposure scenario done in the ACC HHRA estimated risk from direct contact with surface soil (i.e., dermal contact, incidental ingestion, and inhalation of particulates and vapors outdoors). These pathways are no longer relevant as a result of the cleanup done at the facility site. As previously discussed, the most contaminated areas were excavated to a depth of 10 feet, backfilled and a soil cap with a geomembrane was placed above these areas. Floating product was removed from the groundwater. Six to eight feet of additional fill was also placed on top of the cap prior to construction of the buildings. However, indoor air exposure for current building occupants due to vapor intrusion has not been evaluated. Additional analyses of this pathway will be done during the next year as a part of the determination of the protectiveness of the remedy.

(II) Evaluation of ROD Cleanup Levels and ARARs

(A) Soils

In the ROD, the human health cleanup objectives for soil in the facility and the residential areas were based on performance requirements that "were consistent with the numerical cleanup criteria of the Washington State Model Toxics Control Act (MTCA) regulations (Method B, residential)". The MTCA soil cleanup standards shown in the ROD are based on an acceptable cancer risk level of 1 X 10^{-6} for each chemical in the residential area.

Changes have occurred to the Washington State Model Toxics Control Act (MTCA) soil cleanup levels since remedy selection. Some of these changes have occurred since the last five year review. In addition to some numerical changes in the MTCA Methods B soil cleanup values (see below), the new regulations clarify how the MTCA Method B cleanup values are to be applied. For example, the new regulations clarify that chlorinated dioxins and furans and carcinogenic PAHs are to be treated as single TEQ mixtures and that the TEQ concentration of the mixture must meet the MTCA B value set at a cancer risk of 1 X 10^{-6}. (The TEQ values to be used in MTCA for both cPAHs and dioxins/furans are identical to those used for calculating SLVs in the Regional EPA Residential Soil Regional Screening Level Values Tables that were discussed above).

A comparison of the MTCA Method B soil cleanup values used in the ROD for the residential area to the most current MTCA Method B values are shown below:

Chemical	Benzo(a)pyrene		Pentachlorophenol		2,3,7,8 – TCDD	
MTCA Method B Cleanup standard (mg/kg)	ROD criteria	Current criteria	ROD criteria	Current criteria	ROD criteria	Current criteria
	0.172	0.14	8.3	8.3	6.6×10^{-9}	$1.1\text{x}10^{-5}$

The cleanup value for pentachlorophenol has not changed. The value for B(a)P equivalents has decreased slightly from 0.172 to 0.14 mg/kg. The MTCA Method B soil value shown in the ROD for 2,3,7,8-TCDD TEQ (0.0066 ng/kg or 6.6 X 10^{-9} mg/kg) appears to be an error as the MTCA Method B value in the FS (published less than a year before the ROD) is 5.4 X 10^{-6} mg/kg. It is assumed that the units in the ROD are off by 3 orders of magnitude, therefore, the MTCA B cleanup value that should have been in the ROD is likely 6.6 X 10^{-6} mg/kg. The current MTCA B value is slightly higher at 1.1 X 10^{-5} mg/kg which can be explained by one of the methodological changes in MTCA since the ROD was signed (i.e., the use of 0.6 as the gastrointestinal absorption fraction for dioxins in soil in the current regulations compared to 1.0 in the older regulations). Therefore, although changes have occurred in the MTCA Method B soil cleanup values for two (dioxins and cPAH) of the three major risk drivers since the ROD was signed in 1993, these changes are either not significant (change in B(a)P equivalents from 0.172 to 0.14 mg/kg) or result in a higher clean-up value (change in 2,3,7,8,- TCDD TEQ from 6.6 X 10^{-6} to 1.1 X 10^{-5} mg/kg). The MTCA cleanup values in the above table are for individual chemicals; the total risk from all chemicals under MTCA must be below a cancer risk of 1 X 10^{-5}. Because EPA remediated all residential areas that were above a total cancer risk from all chemicals of 1 X 10^{-6}, this remediation is in compliance with the current MTCA Method B soil cleanup levels. A review of the non-numerical MTCA changes that relate to application of the clean-up values did not find any modifications that would change this conclusion. In addition, the risk levels used to define remediation done at the site were within or below EPA's acceptable cancer risk range for Superfund of 1 X 10^{-6} to 1 X 10^{-4}.

For the ACC HHRA, risks from soil exposures in the residential area were calculated by using the 95% UCL on the mean of all of the residential area soil samples. During the FS, samples from individual yards/areas were reviewed to define which residential lots and other sites (e.g., playgrounds) were above the MTCA B cleanup values (set at 10^{-6} cancer risk) so that the volume of soil that would need to be removed under different alternatives could be estimated. Approximately 2 years after the ROD was signed, in 1995, a supplemental risk evaluation was done for soil ingestion for one age group, children age 0 to 6 years (the majority of the lifetime cancer risk was attributed to this age group).

EPA performed this supplemental risk evaluation for the ACC residential soil scenario because updated risk assessment methodologies and updated toxicity factors became available after the ROD was signed. This evaluation was done to confirm that the cleanup areas outlined in the FS and the ROD for the residential area were still appropriate. In the updated methodology, the manner in which risk was calculated for cPAHs was modified. As already discussed, in the HHRA, all cPAHs were assumed to be equivalent in cancer potency to benzo(a)pyrene (B(a)P). Subsequent to the ROD signing, EPA developed Toxic Equivalency Factors for cPAHs in which the toxicity of a cPAH is scaled depending on its toxicity to that of B(a)P. This approach (consistent with the most recent MTCA changes and with current EPA guidance) lowered the estimated cancer risk for those residential/commercial areas if cPAHs other than B(a)P and dibenz(a,h)anthracene were present. The lower toxicity factor (cancer slope factor) for B(a)P (lowered from 11.5 to 7.3 $(mg/kg\text{-}day)^{-1}$) was also used. This risk calculation more precisely defined the areas that were "below the point of departure from the NCP and MTCA", that is, those areas that were below a total cancer risk of 1×10^{-6}. Twelve of the residential/commercial lots or lot portions identified for remedial activity in the ROD were below a 1×10^{-6} cancer risk. The commercial lots below a cancer risk level of 1×10^{-6} were not remediated. However, the residential lots or portions of lots identified in the ROD that were below cancer risk level of 1×10^{-6} based on these newer calculations were still remediated. Thus, the risk levels used to define remediation done at the site were within or below EPA's acceptable cancer risk range for Superfund of 1×10^{-6} to 1×10^{-4} and also consistent with the MTCA B values for B(a)P TEQ.

(B) Water

The main body of this document discusses changes in ARARs that were used in the ROD. These ARARs included:

- Groundwater -MTCA Method B and federal and state MCLs
- Surface Water – MTCA Method B (for protection of aquatic life) and acute and chronic WQC and WQS for aquatic life.

Based upon the previous discussion on the designated uses of Dillenbaugh Creek for fish harvesting and as a drinking water source, additional ARARs would be added for surface water. These would include MTCA Level B values for surface water which consider its use as a fishery and drinking water source; WQC and WQS for human health fish consumption and drinking water, and; state and federal MCLs. A discussion of these ARARs and their values are found in Section VII, Technical Assessment, Question B of the Five Year Review.

TABLE 1
Calculation of Residential Property Risks Using ACC HHRA Soil Values and EPA Regional Screening Levels

	Soil Concentration (RME 95%UCL) Used for Residential Soil HHRA at ACC	Total risks in ACC HHRA from soil ingestion and inhalation (done in risk characterization)[1]	Total risks in ACC HHRA from soil ingestion and inhalation (done in risk characterization) and dermal pathway (done in uncertainty section)[2]	Risks for corresponding soil concentrations using EPA Regional Screening Level Tables (soil ingestion, inhalation and dermal pathways)[3]
COMPOUNDS	(mg/Kg)			
Pentachlorophenol	1.36			4.60E-06
PAHs (carcinogenic)	3.99			2.70E-04
Dioxins/Furans	0.00037			8.20E-05
Total Cancer Risks		2.00E-04	1.8E-03	3.50E-04

[1] Based on sum of risk from incidental ingestion of soil for 0 to 6 year olds (1 x 10-4), 6 to 18 year olds (4 x 10-5), and 18 to 75 year olds (5 x 10-6) and risk form inhalation for 0 to 6 year olds (3 x 10-7), 6 to 18 year olds (1 x 10-5), and 18 to 75 year olds (2 x 10-7)

[2] Based on sum of risk from incidental ingestion and inhalation (see footnote 1) as well as dermal absorption for 0 to 6 year olds (4 X 10-4), 6 to 18 year olds (5 x 10-4) and 18 to 75 year olds (7 x 10-4)

Results from HHRA:

Soil Ingestion	0 to 6	1.00E-04	1.00E-04
	6 to 18	4.00E-05	4.00E-05
	18 to 75	5.00E-05	5.00E-05
Inhalation	0 to 6	3.00E-07	3.00E-07
	6 to 18	1.00E-05	1.00E-05
	18 to 75	2.00E-07	2.00E-07
Dermal Exposure	0 to 6		4.00E-04
	6 to 18		5.00E-04
	18 to 75		7.00E-04
Risk calculated in ACC HHRA		2.0E-04	1.8E-03

[3] Use of EPA Regional Screening Levels (SLV) to estimate ACC residential area risks

	95% UCL Soil Conc Used for ACC HHRA (mg/kg)	Residential Soil SLV (at 1×10^{-6}) (mg/kg)	Cancer Risk Using ACC HHRA Residential Soil Values and Regional SLVs
Pentachlorophenol	1.36	3	0.45×10^{-6}
B(a)P TEQ	3.99	0.015	2.7×10^{-4}
2,3,7,8-TCDD TEQ	0.00037	4.5×10^{-6}	8.2×10^{-5}
Total risk for soil ingestion, inhalation and dermal pathways			3.5×10^{-4}

Table 2a

Location	Study/source	TEQ (pg/g)	TEQ mean (pg/g)
Dillenbaugh Creek Sediments			
Dillenbaugh Creek sediments	WDOE 2005 below lagoon	48-790	308
	WDOE 2005 above lagoon	3.7 - 23	
	WDOE 2002 EPA RI 1991 WDOE 1986	11.8- 1156 1.1-319 593	391 80
Dillenbaugh Creek Vicinity			
Chehalis River below Dillenbaugh Creek confluence	WDOE 2002	2.1-6.9	4.5
Chehalis River "background"	WDOE 2002	0.8	
Dillenbaugh Creek upstream of ACC "background"	WDOE 2002 EPA RI 1991	8.2 <0.1-1.7	
ODEQ SLV ODEQ SLV	17.5 g/day 142 g/day	0.009 0.001	

Table 2b

Location	Study/source	Fish and sample type	TEQ (ng/g)
Dillenbaugh Creek Sediments			
Dillenbaugh Creek downstream of ACC	WDOE 2002	Cutthroat Trout (F/SK Comp, 3 fish) 208 mm	2.64
		Brown Bullhead (WB, 1 fish) 220 mm	4.5
Dillenbaugh Creek Vicinity			
Chehalis River	WDOE 2002	Largescale Sucker (WB Comp, 5 fish) 413 mm	0.55
		LS Sucker (WB Comp, 5 fish) 409 mm	0.38
		Mt Whitefish (F/Sk Comp 5 fish) 246 mm	0.51

F/SK = fillet with Skin
WB = Whole Body

ARARs Review Summary, American Crossarm and Conduit Site

Medium	Source/ARAR	Applicable or Relevant and Appropriate	Requirement Synopsis	Initial Comment on Application	Current ARAR Evaluation/Changes
Chemical-Specific ARARs					
Groundwater/ Soil	Model Toxics Control Act; Selection of Cleanup Actions, WAC 173-340-360; Institutional Controls, WAC 173-340-440; Use of Method B Cleanup Levels, WAC 173-340-705; Groundwater Cleanup Standards, WAC 173-340-720; Soil Cleanup Standards, WAC 173-340-740 and 173-340-745	Applicable	MTCA describes the order of preference for cleanup technologies and use of permanent solutions; use of institutional controls where active cleanup measures will not attain MTCA cleanup levels; and the determination of groundwater and soil cleanup levels.	Groundwater actions were not part of the selected remedy other than removal of floating product. Therefore, groundwater cleanup levels are to be met at the facility boundary. Soils cleanup levels will be met on the facility through containment and monitoring.	This is applicable. The groundwater is currently not a source of drinking water and residual contamination remains at depth. Low-level contaminated soil does remain on Site however this is contained beneath a geomembrane and 10 – 17 feet of fill. Changes in MTCA in 2007 include procedures used to calculate cleanup levels for dioxins, carcinogenic PAHs, and PCBs.
Groundwater	Safe Drinking Water Act, National Primary Drinking Water Regulations, 40 CFR 141; Public Water Supplies, WAC 246-290	Applicable	Requirements applicable to public water systems. Establish "maximum contaminant levels" (MCLs), the maximum permissible level of a contaminant in water which is delivered to users of a public water system. MCLs are health-based standards.	Groundwater actions were not part of the selected remedy other than removal of floating product. Therefore, MCLs are to be met at the facility boundary.	This is relevant and appropriate. The groundwater is currently not a source of drinking water. Groundwater is monitored at locations off-Site. Available monitoring data suggests MCLs are being achieved. No changes to the SDWA.
Sediments	Federal Water Quality Standards, 40 CFR 131, State Water Quality Standards, WAC 173-201A.	Relevant and appropriate	Defines the water quality goals of a water body providing water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in	Over time this requirement would be met through natural attenuation and source removal. No remediation of contaminated sediment occurred during remedial action.	This is still relevant and appropriate. Contaminated sediment may remain in Dillenbaugh Creek. Federal WQS have changed for pentachlorophenol.

Medium	Source/ARAR	Applicable or Relevant and Appropriate	Requirement Synopsis	Initial Comment on Application	Current ARAR Evaluation/Changes
			and on the water.		
Action-Specific ARARs					
Contaminated soil/wastewater	Resource Conservation and Recovery Act, 40 CFR 261 – 268; 40 CRF 264 Subpart I. J, L; Washington Dangerous Waste Regulation, WAC 173-303 WAC	Applicable	These establish regulations for treatment, storage, and disposal of hazardous wastes.	Contaminated soils and wastewater required off-Site disposal.	This is no longer applicable. It is relevant and appropriate. No hazardous waste is being generated on Site requiring off-Site disposal. Several changes occurred in the Dangerous Waste Regulation in 2005. Primary changes incorporated federal requirements into the Washington state rules.
Surface water	Clean Water Act, 33 U.S.C. 1317; 40 CFR 403.5; National Discharge Elimination System (NPDES), Washington Water Pollution Control Act, RCW 90.48; NPDES Permit Program Requirements, WAC 173-220	Applicable	These regulations pertain to the off-Site disposal of treated groundwater. 40 CFR 403.5 prohibits discharges of pollutants into publicly owned treatment works that pass through the facility without treatment or that interfere with the treatment works.	Wastewater from the remedial action was treated to meet the substantive requirements of the state NPDES permit prior to discharge to surface water bodies beyond the area of contamination.	This is no longer applicable. It is relevant and appropriate. No wastewater is being treated as part of the remedy. Changes to the NPDES include the issuance of new construction general permits and new multi-sector general permits.
Non-hazardous waste	Washington Solid Waste Recovery and Management Act, RCW 70.95	Relevant and Appropriate	The purpose of this chapter is to establish a comprehensive statewide program for solid waste handling, and solid waste recovery and/or recycling which will prevent land, air, and water pollution and conserve the natural,	Solid waste generated during the remedial action required compliance with the substantive requirements.	This is still relevant and appropriate. Changes include the purpose and definitions.

Medium	Source/ARAR	Applicable or Relevant and Appropriate	Requirement Synopsis	Initial Comment on Application	Current ARAR Evaluation/Changes
			economic, and energy resources of Washington State.		
Hazardous waste	Transportation of Hazardous Materials, WAC 446-50	Relevant and Appropriate	This provides requirements for transporting hazardous materials	Contaminated soils and wastewater required off-Site disposal.	This is still relevant and appropriate. No hazardous waste is being generated on-Site requiring off-Site disposal. Changes in 2003 adopted the Federal requirements of transporting hazardous materials.
Groundwater	Water Well Construction, RCW 18.104	Relevant and Appropriate	This provides requirements on the construction of wells in the State of Washington	The installation of monitoring wells as part of the remedial action required compliance with this rule.	This is still relevant and appropriate. Changes in 2005 include revisions of the definitions, delegation of authority, reporting well construction/decommissioning, fees, and licenses
Location-specific ARARs					
Wetlands	Executive Order 11990, Executive Order of Protection of Wetlands	Applicable	Requires EPA to avoid long and short tem adverse impacts associated with the destruction or modification of wetlands and avoid direct or indirect support of new construction in wetlands whenever there is a practicable alternative.	The remedy was not expected to impact the floodplain or the lagoon.	This is still applicable. Contaminated sediment in the wetland was not removed during the remedial action. No changes.
To Be Considereds (TBCs)					
Shoreline	Shoreline Management	TBC	This governs the use	During Site development,	This is still a TBC. Although

Medium	Source/ARAR	Applicable or Relevant and Appropriate	Requirement Synopsis	Initial Comment on Application	Current ARAR Evaluation/Changes
	Act, RCW 90.58		and development of shorelines in Washington State. Specifically, it strives to balance responsible shoreline development with environmental protection and public access	a design permitting plan is required.	the majority of the Site has been developed since the remedial action, the landfill area has not. Changes include the specifying jurisdiction of this act.
Groundwater	Licensed Well Drillers, WAC 173-162	TBC	This provides procedures for the examination, licensing and regulation of well contractors and operators.	Drillers who install new wells including resource protection wells are to comply with these requirements.	This is still a TBC. Changes in 2006 were made to be consistent with changes in the drilling statute and to be current with new drilling technologies.
Worker Safety	Safety for Construction Workers, WAC 206-155	TBC	The standards apply throughout the state of Washington. These standards are minimum safety requirements with which all industries must comply when engaged in the following types of work: construction, alteration, demolition, related inspection, and/or maintenance and repair work, including painting and decorating	The remedial action included demolition of Site buildings and general construction work.	This is still a TBC. No changes.
Worker Safety	WISHA Hazardous Waste Operations, WAC 296-65, Part P	TBC	This standard regulates asbestos removal and encapsulation, requires contractor certification, specifies minimum training for supervisors and workers on	During the remedial action, the demolition included asbestos abatement.	This is still a TBC. No changes.

Medium	Source/ARAR	Applicable or Relevant and Appropriate	Requirement Synopsis	Initial Comment on Application	Current ARAR Evaluation/Changes
			asbestos projects, requires notification of asbestos projects, and establishes a training course approval program.		